

LUCANUS.



L. Elaphus.

ILLUSTRATIONS
OF THE
LINNÆAN GENERA
OF
INSECTS.

L.C.Cde.
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Testaceologicus, &c.

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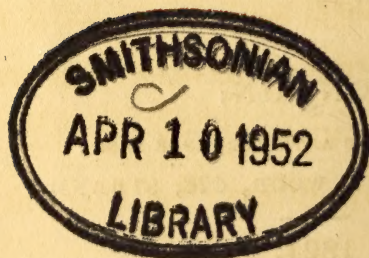
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ADVERTISEMENT.

THE small work which is now offered to the Public, was undertaken at the suggestion of those who, feeling themselves inadequate to plunge immediately into the ocean of new Genera, were still desirous to enter by degrees upon the subject of Entomology. To the excellence of the popular and entertaining work by Kirby and Spence, the Public have borne ample testimony, and many have been induced by its pages to desire a more intimate acquaintance with its contents. To such, and many others, the Illustrations

of the Linnæan Genera may be very useful, since they will satisfy those who are willing to become easily acquainted with the subject; at the same time that the zealous Entomologist, who wishes to try how far he is able to improve a system, cannot have a better foundation to proceed upon.

*The Method of catching and preserving
Insects for Collections*.*

I. INSECTS of the first Order (COLEOPTERA) are found in and under the dung (*Scarabæus*, *Dermestes*, *Hister*, *Staphylinus*) of animals, especially of cows, horses, and sheep. Many of them make holes under the dung three or four inches deep ; it would therefore be necessary to have an iron spade to dig them out when in search of this tribe of insects.

Some (*Lucanus*, *Cerambyx*, *Dermestes*) are found in rotten and half-decayed wood, and under the decayed bark of trees. On the carcasses (*Hister*, *Silpha*, *Staphylinus*) of animals that have been dead four or five days, on moist bones that have been gnawed by dogs or other animals, on flowers having a fetid smell, and on several kinds of fungous substances, particularly the rotten and most stinking : others (*Byrrhus*,

* Ellis.

Curculio, *Bruchus*) may be found in a morning about the bottoms of perpendicular rocks and sand banks, and also upon the flowers of trees and herbaceous plants.

Many kinds (*Gyrinus*, *Dytiscus*) may be caught by a net at the end of a long pole, in rivers, lakes, and standing pools.

In the middle of the day when the sun shines hot, some (*Coccinella*, *Buprestis*, *Chrysomela*, *Cantharis*, *Elater*, *Necydalis*) are to be seen on plants and flowers, blighted trees and shrubs ; others (*Lampyris*) in moist meadows, and are best discovered at night, by the shining light which they emit.

A great variety (*Cassida*) sit close on the leaves of plants, particularly of the burdock, elecampane, coltsfoot, dock, thistle, &c. or feed on different kinds of tender herbs (*Meloe*).

Numbers (*Tenebrio*) may be found in houses, dark cellars, damp pits, caves, and subterraneous passages, or on umbelliferous flowers (*Cerambyx*, *Ptinus*); on the trunks as well as the leaves of trees; in timber-yards, and in the holes of decayed wood.

Some (*Leptura*, *Cicindela*) inhabit wild commons, the margins of pools, marshes, and rivulets; and are likewise seen creeping on flags, reeds, and all kinds of water-plants.

Multitudes (*Carabus*) live under stones, moss, rubbish, and wrecks near the shores of lakes and rivers. These are found also in bogs, marshes, moist places, pits, and holes of the earth, on stems of trees; and in an evening they crawl plentifully along pathways after a shower of rain.

Some (*Forficula* or *Earwigs*) may be discovered in the hollow stems of decayed umbelliferous plants, and on many sorts of flowers and fruits.

II. Insects of the second Order (HEMIPTERA) are found about (*Blatta*) bake-houses, corn-mills, in ships, and in all places where meal is kept; on grass (*Mantis*, *Gryllus*, *Fulgora*, *Cicada*, *Cimex*), and all kinds of field herbage. Some (*Notonecta*, *Nepa*) of these frequent rivers, lakes, and standing pools.

III. The third Order (LEPIDOPTERA) includes Butterflies and Moths. In the day,

when the sun is warm, Butterflies (*Papilio*) are seen on all sorts of trees, shrubs, plants, and flowers. Moths (*Phalæna*) may be found in the day-time, sitting on walls, pales, trunks of trees, in shades, out-houses, dry holes, and crevices; on fine evenings they fly plentifully about the places they inhabit in the day-time: Some (*Sphinx*) are seen flying in the day-time over the flowers of honey-suckles and other plants with tubular flowers. Insects of this species seldom sit to feed, but continue vibrating on the wing, while they thrust the tongue or proboscis into the flower, and in that action are most easily caught.

IV. Insects of the fourth Order (NEUROPTERA) are found in woods (*Myrmeleon*, *Hemerobius*, *Raphidia*), hedges, meadows, sandbanks, walls, pales, fruits, and umbelliferous flowers; some (*Libellula*, *Ephemera*, *Phryganea*) fly about lakes and rivers in the day.

V. The fifth Order (HYMENOPTERA), including Wasps (*Vespa*), Bees (*Apis*), &c. may be seen about hedges (*Tenthredo*, *Sirex*, *Ichneumon*, *Sphex*, *Vespa*, *Apis*), shrubs, flowers,

and fruits. Wasps and Bees are the only winged insects that have any great degree of poison in them; they should therefore be taken with a pair of forceps, and handled cautiously on account of their stings. Some (*Mutilla*) of this division have stings but no poison, and are to be found on the flowers of umbelliferous plants, when the sun shines hot in the middle of the day, at which time others (*Chrysis*) are seen on sand-banks, walls, and pales.

VI. Insects of the sixth Order (DIPTERA) fly about the tops of trees (*Oestrus* or *Gad-fly*, *Musca*, *Tabanus*, *Hippobosca*), little hills, horses, cows, sheep, ditches, dung-hills, and every offensive object. Some (*Tipula*, *Conops*, *Asilus*) are found on all sorts of flowers, particularly those of a fetid smell. Many (*Bombylius*) of these are most easily taken when they begin to feed; for in the middle of the day they are so quick and active, that it is almost impossible to catch them.

VII. The seventh and last Order (APTERA) contains Scorpions, Spiders, Crabs, Lobsters,

• &c. It is necessary only to observe here, that all kinds of insects having no wings may be preserved in spirits, brandy or rum, except Crabs and Lobsters, which may very conveniently be preserved dry.

The first order of insects, consisting of Beetles (COLEOPTERA), are hard-winged. Many kinds fly about in the day, others in the evening, some at night only. They may be caught with a gauze net, or a pair of forceps covered with gauze. When they are taken, stick a pin through the middle of one of the ~~hard~~ wings, and pass it through the body. They may be killed instantly, by immersion in hot water, as well as in spirit of wine; then stick them on a piece of cork, and afterwards carefully place their legs in a creeping position, and let them continue exposed to the air until all the moisture is evaporated from their bodies. Beetles may also be preserved in spirit of wine, brandy, or rum, closely corked up.

Insects of the second Order (HEMIPTERA) may be killed in the same manner as beetles,

and likewise by means of a drop of the ethereal oil of turpentine applied to the head.

The division of butterflies and moths (LEPIDOPTERA), as well as all flies with thin membranaceous wings, should be caught with a gauze net, or a pair of gauze forceps. When taken in the forceps, run a pin through the thorax or shoulders, between the fore-wings. After this is done, take the pin by the head, and remove the forceps, and with the other hand, pinch the breast of the insect, and it will immediately die. The wings of butterflies should be expanded, and kept so, by the pressure of small slips of paper, for a day or two. Moths expand their wings when at rest, and they will naturally take that position.

The best method of having the most perfect butterflies, is to find out, if possible, the larva or caterpillar of each, by examining the plants, shrubs, or trees they usually feed upon, or by beating these shrubs and trees with long poles, and by that means shaking off the caterpillars into a sheet, previously spread underneath the

shrubs, &c. for this purpose; put them into boxes covered with thin canvas, gauze, or cat-gut, and feed them with the fresh leaves of the tree or herb, on which they are found; when they are full grown, they will go into the pupa or chrysalis state, and require then no other care, till they come out a perfect butterfly, at which time they may be killed, as before directed. Sometimes these insects may be found hanging to walls, pales, and branches of trees, in the chrysalis state.

Moths might likewise be procured more perfect, by collecting the caterpillars, and breeding them in the same manner as butterflies. As the larvæ or caterpillars cannot easily be preserved dry, nor very well in spirit, it would be satisfactory if exact drawings could be made of them while they are alive and perfect. It may be necessary to observe, that in breeding these kind of insects, some earth should be put into the boxes, as likewise some rotten wood in the corners; because, when the caterpillars change into the chrysalis state, some go into

the earth, and continue under ground for many months before they become moths ; and some cover themselves with a hard shell, made up of small pieces of rotten wood. Hence also, as many go into the earth, valuable insects may sometimes be found by digging after them a foot deep, about the roots of trees, shrubs and plants.

The fourth order of insects (NEUROPTERA) may be killed with spirit, or with a drop of ethereal oil of turpentine.

Insects of the next order (HYMENOPTERA) are best killed by oil of turpentine also. A pin may be run through the bodies of these, between the fore-wings.

Those of the sixth order (DIPTERA) may be killed with spirit of wine.

The last division (APTERA) in general are subjects which should be kept in spirit.

When in search of insects, we should have a box suitable to carry in the pocket, lined with cork at the bottom and top, to stick them upon until they are brought home. If this box be

strongly impregnated with camphor, the insects soon become stupefied, and are thus prevented from fluttering, and injuring their plumage.

In hot climates, insects of every kind, but particularly the larger, are liable to be eaten by ants and other small insects, especially before they are perfectly dry. To avoid this, the piece of cork on which the insects are stuck in order to be dried, should be suspended from the ceiling of a room, by means of a slender string or thread, covered with bird-lime, or some adhesive substance, to intercept vermin in their passage.

After the insects are properly dried, they may be placed in the cabinet or boxes where they are to remain. These boxes should be kept dry, and also made to shut very close, to prevent small insects from destroying them; the bottoms of the boxes should be covered with pitch, or green wax, over which paper may be laid, or, which is better, lined with cork, well impregnated with a solution of a quarter of an ounce of corrosive sublimate, in

half that quantity of ethereal oil of turpentine, and a pint of the camphorated spirit of wine.

The finest collections have been ruined by small insects, and it is impossible to have our cabinets too secure. Such insects as are thus attacked may be immersed in spirit of wine, without injuring their fine plumage, or colours; and afterwards let them be sprinkled about their bodies and insertions of the wings with the solution above mentioned. We may dissolve a much larger proportion of sublimate, by means of a saturated solution of crude sal-ammoniac in water: an ounce of the sal ammoniac solution will dissolve twenty scruples of the sublimate.

These observations and directions respecting insects, may, perhaps, be the means of exciting the curiosity of some, whose inquiries after this part of natural history will be amply compensated by the frequent opportunities of enlarging their knowledge, as there is scarce any part of the surface of this globe, scarce a tree, a shrub, or a plant; an animal either living

or dead, or even the excrements of animals, on which some kind of insect does not depend for its subsistence and propagation. An inquisitive traveller, as well as every other person, has it more or less in his power to add to the common stock of knowledge, with very little expense either of time or labour.

An Explanation of the principal Terms used in Entomology.

ABDOMEN, the hinder part of the body distinct from the thorax, and formed of segments or rings.

Achivi, a subdivision of the genus *Papilio*, containing those species of the section *Equites* which have no blood-red spots on them; but an ocellum, or eye, at the inner angle of the posterior wings.

Aculeated, armed with points.

Aculeus, the sting, a sharp dart seated in the extremity of the abdomen.

Adscitæ, a division of the genus *Sphinx*, containing such species as differ in habit from the true or legitimate *Sphinges*, and whose larvæ are likewise different.

Alæ, the wings.

Alucitæ, a division of the genus *Phalæna*, including those with digitated wings, that is, split to the base.

Angulated, wings, the posterior margin having prominent angles.

Antennæ, the horns, two slender bodies placed upon the head, for the most part articulated.

Apex, in the wings, the part opposite to the base terminating the anterior margin: in the *Elytra*, the part at the extremity of the abdomen.

Aptera, from α , without, and $\piτερον$, a wing, the name of the seventh order of insects; including those which have no wings, such as the spider, &c.

Apterous, where the insects of the order *Coleoptera* want the under wings, and have the *elytra* united, so as to form one case. This occurs in some species of the genera *Curculio*, *Tenebrio*, and *Mordella*.

Aristated, terminating in a beard or bristle.

Articulated, with distinct joints.

Attaci, a division of the genus *Phalæna*, with spreading wings, inclining downwards.

Attenuated, narrowing towards the end.

Aurelia, a term formerly applied to that sort of chrysalis, or pupa, which is of a golden colour.

B.

Bearded, tufted with hair.

Bicaudated, swallow-tailed, having two projecting processes from the hinder wings.

Bivalve, beak consisting of two concave valves united so as to form a tube.

Bombyx, a division of the genus *Phalæna*, including those with incumbent wings and pectinated antennæ.

C.

Canaliculated, channelled, having a longitudinal hollow or groove.

Capitated, antennæ ending in a club or knob.

Carinated, the thorax, or elytra, raised into a straight longitudinal ridge like a keel.

Caudated, tailed, having a projection from the end of the abdomen, or wing, &c.

Cheliform, the palpi, antennæ, feet, &c. ending like the claw of a crab.

Chrysalis, synonymous with Pupa, Nympha, Aurelia.

Cicatrix, a raised spot.

Ciliated, fringed with hairs.

Clavated, club-shaped, referring to the antennæ, palpi, &c. when they gradually thicken towards the apex.

Clypeus, a horny horizontal part of the head covering the mouth.

Coleoptera, derived from *κολεός*, a sheath, and *πτερόν*, a wing. The name of the first order of insects, including such as have crustaceous elytra, which in

most cover the abdomen entirely, in some but partially, as in the Earwig, &c.

Compressed, the body flattened at the sides.

Connated, elytra united at the suture.

Convex, thorax raised towards the centre like the segment of a sphere.

Convolutcd, when the wings are wrapped round the abdomen.

Cordated, heart-shaped.

Coriaceous, of a substance like leather.

Cornuted, some part of the insect ending in a horn.

Costa, the margin of the wings in the Butterfly between the base and the apex.

Crenated, the margin of the thorax, or wings, notched.

Cristated, the thorax with an arched keeled ridge, toothed and compressed.

Cruciated, the inner margins of the wings lying over each other, or folded together crosswise.

Crustaceous, elytra, hard, elastic, resisting the impression of the finger.

Cutaceous, integument, soft, yielding to the finger.

Cylindrical, beak, &c. linear and round.

D.

Danai, a division of the genus *Papilio*, containing those with very entire wings, which are either white or variegated.

Deflected, wings incumbent, with the outer edges declining towards the sides.

Dentated, the margins set with short points like teeth.

Denticulated, wings, marked with minute distinct dents.

Denudated, wings, bare or destitute of scales.

Depressed, head, &c pressed downwards.

Digitated, divided nearly to the base, like fingers.

Diptera, derived from δύο, two, and πτερόν, a wing,

The sixth order of insects, including those with two wings only, such as the House Fly, &c.

Discus, the middle of the elytra between the base, the apex, the margin, and the suture ; also the middle of the thorax.

Divaricated, wings, incumbent but diverging behind.

E.

Elytra, the two crustaceous or coriaceous wing-cases of beetles, &c. which are expanded in flight, but which, when at rest, cover the abdomen, and hide the membranous wings.

Equites. Those Papilios whose upper wings are longer from the posterior angle to the apex, than from the same angle to the base.

Eruca, the old word for Larva.

F.

Falcated, shaped like a sickle.

Fascia, a broad transverse line.

Fasciculus, a tuft on the back of the caterpillar, &c.

Femora, the thighs, that part of the limbs nearest the trunk.

Filiform, antennæ, of the same thickness through their whole length.

Fissiles, the knob of club-shaped antennæ split longitudinally into several parallel parts or laminæ.

Flexuose, irregularly waving.

Foliaceous, spread out like a membrane.

Furcated, forked, divided into two parts at the ends.

Fusiform, antennæ, growing gradually thicker towards the middle.

G.

Gemmati, a subdivision of the section Nymphales, in the genus Papilio, containing such as have ocelli, or eyes, in their wings.

- Geniculated*, bent, making an angle at the flexure.
Geometra, a division of the genus *Phalæna*, with wings spreading horizontally when at rest.
Gibbous, thorax, the disc raised but not spherical.
Gregarious, living in society.
Guttated, dotted.

H.

- Halteres*, poisers, two globular bodies placed on slender stalks behind the wings, and seated on the thorax. Confined to the insects of the order *Diptera*.
Hastated, javelin-shaped.
Haustellum, a sort of trunk at the mouth of the insect, consisting of bristles, inclosed generally in a bivalve sheath.
Heliconii, a division of the genus *Papilio*, including those with narrow, oblong, entire primary wings, sometimes appearing deprived of scales; the posterior wings very short.
Hemelytra, wings, either wholly or in part formed of a substance intermediate between leather and membrane.
Hemiptera, derived from ἡμισυ, half, and πτερόν, a wing. The second order of insects, including those which have their upper wings for the most part half crustaceous and half membranaceous, not divided, as in the order *Coleoptera*, by a longitudinal suture, but incumbent on each other, as in the *Water-scorpion* and *Grasshopper*.
Hemispherical, body convex above, flat below, like the segment of a globe.
Hispid, elytra, antennæ, &c. thickly covered with short hairs.
Hymenoptera, derived from ὑμῆν, a membrane or pellicle, and πτερόν, a wing. The fifth order of in-

sects, including those which have four membranous wings, and a tail furnished with a sting.

I.

Imago, the perfect insect after having gone through the states of Larva and Chrysalis

Imbricated, set with scales lying over one another, like the tiles of a house.

Incumbent, wings, which when at rest cover the back of the abdomen horizontally.

Incurvated, wings, the anterior margin bent like an arch.

Incurved, palpi, &c. turning straight upwards at the ends, as if lying over the mouth.

Inflexed, rostrum, or beak, not projecting, but bent and going towards the belly by the breast.

Interrupted, bands, &c. broken, but continued either above or below.

L.

Labia, prominent parts including the mouth.

Lanceolate, antennæ, wings, &c. oblong, attenuated at both ends.

Larva, caterpillar, grub, maggot, the animal as it comes from the egg.

Lepidoptera, from *λεπίς*, a scale, and *πτερόν*, a wing.

The third order of insects, including those with wings covered with fine scales, like powder or meal, as in the Butterfly, &c.

Lineare, body, &c. oblong, equal in breadth throughout.

Lineated, elytra, marked with depressed lines.

Lingua, the tongue, a membranaceous or fleshy organ lying hid among the palpi, and rolled up.

Lobated, thorax, divided into distinct parts.

Lunated, resembling a crescent or new moon.

Lunulated, maxillæ, thick in the middle and smaller towards the base and the apex.

M.

Macula, a spot, of an indeterminate figure, and of a different colour from the ground.

Maculated, marked with spots.

Marginated, thorax, elytra, &c. with a free elevated margin.

Maxillæ, jaws, the organs of the mouth, mostly two in number. The inner edge in some insects is serrated, or furnished with little teeth.

Moniliform, antennæ, with distinct bead-like articulations.

Mucronated, antennæ, &c. terminating in a sharp projecting point.

Muricated, elytra, rough with rigid spines.

Mutilated, elytra, which do not completely cover the back, whether with respect to length or breadth.

N.

Nebulous, wings, marked with many scattered abrupt lines, of various breadth.

Neuroptera, from *νευρον*, a nerve, and *πτερον*, a wing. The fourth order of insects, including such as have four membranaceous, transparent wings, generally reticulated with veins or nerves, as in the Libellula or Dragon Fly. Tail without a sting.

Noctuæ, a division of the genus *Phalæna*, comprehending those which have incumbent wings, with setaceous, not pectinated antennæ.

Nympha, the same with *Chrysalis* and *Pupa*.

Nymphales, a division of the genus *Papilio*, containing those with dentated wings.

O.

Obcordated, thorax, heart-shaped, with the apex towards the abdomen.

Obovate, thorax, &c. inversely ovate, the narrow end downwards.

Obsolete, indistinct, as if obliterated.

Obtuse, body, thorax, &c. blunt, rounded at the apex.

Ocellated, with one or more eyes.

Ocelli, the same with *Stemmata*.

Ocellus, an eye, with a round spot of a different colour in the middle, which is called the pupil.

Orbiculated, body, the transverse diameter equal to the longitudinal.

P.

Palate, the interior part of the transverse lip.

Palpi, organs placed at the mouth, often articulated, and generally shorter than the antennæ, sometimes two only, frequently four, seldom six.

Pectinated, antennæ, sending out from both sides parallel bristles.

Pectines, in the genus *Scorpio*, two bodies situated between the abdomen and breast, dentated, or pectinated, on one side. See Plate 81. a.

Pectinicornis, the antennæ pectinated.

Pectus, the under part of the thorax, to which the feet are attached.

Pedes, a word applied by Linnæus to the whole limbs of insects, including the femur, tibia, tarsus, and unguis.

Perfoliated, antennæ, knobbed, the knob horizontally split, the pieces connected in the middle.

Petiolated, abdomen, attached to the thorax by means of a slender elongated tube.

- Phalerati*, a subdivision of the section Nymphales, in the genus Papilio.
- Pilose*, set with distinct long hairs.
- Plane*, wings, extended horizontal, which cannot be folded up.
- Plebeii*, a division of the genus Papilio, containing the smaller species.
- Plicated*, wings, which when at rest are folded up, but expanded in flight.
- Plumata*, a section in the division of the genus Musca, containing those species which have the antennæ bristled, but the bristle feathered.
- Plumose*, antennæ like a plume of feathers.
- Porcated*, elytra, with longitudinal ridges.
- Porrected*, stretched straight forward.
- Proboscis*, a hollow tube at the mouth, often fleshy, enlarging at the point.
- Pubescent*, covered with hair.
- Punctated*, marked with very small dots.
- Punctum*, a small dot of a different colour from the rest of the wing.
- Pupa*, synonymous with Nympha, Aurelia, and Chrysalis.
- Pyralides*, a division of the genus Phalæna, with connivent wings of a triangular shape.

R.

- Radiated*, wings, with nerves diverging like rays from a common centre.
- Ramose*, antennæ, with many lateral branches, as in the genus Monoculus.
- Recurved*, proboscis, palpi, &c. turned backwards.
- Remote*, antennæ, &c. distant from each other.
- Reniform*, kidney-shaped, nearly round, hollowed on one side.

Reticulated, wings, with nerves disposed like net-work, as in the Dragon-fly.

Retractile, head, capable of being drawn at pleasure within the thorax, and concealed there.

Reversed, wings, deflexed, and the margin of the secondary wings projecting from under the primary.

Rigid, antennæ, elytra, &c. not flexible.

Rostrated, standing out like a beak.

Rostrum, the mouth lengthened out into a snout.

Rotundated wings, the posterior margin devoid of angles.

Rugose, wrinkled, marked with waved and elevated lines, either longitudinally or transversely.

Rurales, a subdivision of the section *Plebei* in the genus *Papilio*, composed of Butterflies with wings having obscure spots, that is, not transparent.

S.

Sagittated, arrow-shaped.

Saltatorii, insects having feet, with large thighs formed for leaping, as in the grasshopper.

Scutellati, Cimices, having a Scutellum as long as the abdomen, and covering it and the wings.

Scutellum, the hinder part of the thorax, often triangular: the side next the thorax divided from it by a suture.

Serrated, antennæ, &c. toothed like a saw.

Sessile, abdomen, attached to the thorax in its whole breadth; not distant and connected by a filament.

Seta, a bristle.

Setaceous, palpi, antennæ, &c. growing gradually thinner from the base to the point.

Setariæ, a section in the division of the genus *Musca*, containing such species as have a simple bristle on the side of the antennæ, in opposition to *Plumatæ*.

Sinus, a hollow, as if scooped out.

Spiracula, the respiratory organs, situated on the sides of the abdomen.

Spiriform, antennæ, tongue, rolled up in a spiral shape, as in the genus *Papilio*.

Stemmata, shining eyes generally placed together on the crown of the head.

Sternum, the breast bone.

Stigma, the spot in the upper wings, at the branching of the nerves near the anterior margin.

Stigmata, the apertures on the sides of insects, by which they breathe.

Striated, thorax, &c. slightly channelled with parallel lines.

Subcaudated, wings, the process in the posterior wings, hardly longer than the indenture.

Subcutaneous, larvæ, small caterpillars that feed within the substance of a leaf.

Submarginated, thorax, the margin having a distinct rim, but neither free nor elevated.

Subpetiolated, abdomen, attached to the thorax by a short tube, nearly equalling the thorax in breadth.

Subulated, awl-shaped.

Sulcated, with deep hollow furrows.

Suture, the part where the elytra meet and form a line in the middle of the back.

T.

Tarsi, those parts of the limbs between the tibiæ and ungues, generally articulated with three, four, or five joints.

Tessellated, wings, marked with spots chequerwise.

Thorax, the back of the trunk, or that part which is between the head and the body.

Tibiæ, the legs, that part of the limbs between the thighs and the tarsi.

Tineæ, a division of the genus *Phalæna*, with the wings convoluted or rolled up, so as to form a cylindrical figure.

Tomentose, covered with a soft down or wool.

Tortrices, a division of the genus *Phalæna*, with very obtuse wings, the exterior margins of which are curved.

Trochanters, oblong moveable bodies, affixed to the base of the thighs, as in the *Carabi*.

Troes, those *Papilio*s of the section *Equites*, which have bloody spots on the breast.

Truncated, the apex shortened, or terminating abruptly in a transverse line.

Truncus, the trunk, that part of the body between the head and abdomen, in which the feet are inserted, consisting of the *Thorax*, *Scutellum*, *Pectus*, and *Sternum*.

Tuberculated, rough with prominent warts or tubercles.

Tumid, wings, with elevated membranes among the veins.

U. V.

Vagina, a bivalve sheath at the mouth of certain insects, sometimes articulated, and inclosing bristles.

Venter, the under part of the abdomen.

Verticillated, antennæ, with hairs arranged in whirls at the joints.

Villosus, covered with soft hairs.

Undulated, wings, marked with continuous and nearly parallel waving lines.

Ungues, hook-shaped spines at the apex of the *Tarsi*.

Unguiculated, wings, with a membranous tooth or claw at the exterior margin.

Urbicoli, a subdivision of the section *Flebeii*, in the genus *Papilio*, containing such as have for the most part transparent spots on their wings.

LINNÆAN GENERA OF INSECTS.

ORDER I. *COLEOPTERA.*

LINNÆUS has given the name of *Coleoptera* to those insects which have two membranous wings, hidden under corresponding cases, called *Elytra*. These cases are convex, coriaceous, very hard, and joined to each other by a line or suture running from the base of the thorax, and dividing the abdomen into two equal parts. In some particular instances the under wings are wholly wanting. Where this happens, the elytra are united so as to form one case, the suture

being useless where the insect is denied the power of flight. This does not in the least interfere with the character of the order, which depends not upon the number of wings or wing-cases, but upon the real existence of the latter, which in no instance is absolutely wanting. A few of the *Coleoptera*, indeed, such as the *Necydalis*, the *Staphilini*, and some of the *Mordellæ*, have their elytra so short that they scarcely cover the wings. These elytra, nevertheless, however short they may be, most decidedly exist, and may be readily known by their form, their consistence, and their position.

GENUS I. *SCARABÆUS*.

GENERIC CHARACTER.

Antennæ clavated, or club-shaped, the club laminated, or divided longitudinally into different plates, in some seven, in most three, in others two in number. *Palpi*, or feelers, four in number. *Tibiæ*, or second joint of the foremost pair of legs, generally armed with spines or teeth.

General Observations.

This extensive genus, which has been divided by authors subsequent to Linnæus into several different families, contains many insects of great beauty, and some of singular habits. It was from among the *Scarabæi* that the Egyptians took the symbol which we meet with so repeatedly upon their sculptured monuments; and it was also to these insects that we owe the fables in which the ancients indulged, respecting their origin, their habits, and their sex.

Scarabæi are generally met with in shady

places, upon the trunks, or near the roots of decayed trees, gates, and felled timber. The *larvæ*, or grubs, which are buried in the ground or in dung-hills, are fat, soft, and inactive. They have six feet, a ringed body, and a hard scaly head. They are destructive to vegetable roots, and do great mischief to the corn, as well as the grass. It is in search of the grub of the cock-chaffer, *S. Melolontha*, that the crows are so assiduous in their attendance on the plough. This insect, which from striking against persons and other objects in its flight in the dusk of the evening, has given rise to the saying "as blind as a beetle," digs a hole about six inches deep, and there deposits its eggs, from whence proceeds the disgusting grub, which remains under ground four years, changing its skin, at least, once a year.

The two largest species of this genus, are the *S. Hercules* and the *S. Goliath*, the former an inhabitant of South America, and the latter of Africa.

Many of this tribe are remarkable for their

SCARABÆUS.



S. lunaris.

size, and the projections in the shape of horns or tubercles, which, in the males, proceed from the head, the thorax, or both parts together. They feed, for the most part, on vegetable substances, but generally prefer those which are decomposed, such as dung, tan, &c. Beetles feeding on leaves, or the honey collected from flowers, are generally of agreeable and even shining colours, whilst those that attach themselves to tan and filth, are of a uniformly dark appearance and retired habits. They shun the light, are slow in their motions, and seldom quit their retreats till the evening, or during the night.

SPECIFICATION.

SCARABÆUS LUNARIS. Sc. exscutellatus, thorace bicorni; intermedio obtuso bifido, capitis cornu erecto, clypeo emarginato. *Linn. Syst. Nat.* p. 534. *Gmel.* p. 1535. *Fabr. Syst. Ent.* p. 22. *Spec. Insect.* 1. p. 24. *Mant. Ins.* 1. p. 13. *Ent. Syst.* 1. p. 46. *Degeer*, 4. p. 149. *pl.* 10. *f.* 1. *Roesel.* 2. p. 21. *pl.* B. *f.* 2. *Panzer, Faun. Ins. Germ. fasc.* 49. No. 4. Inhabits Europe, and is found in horsedung, &c.

Panzer mentions a variety with the wing-cases of a chesnut colour.

Plate 1. a. a. Antennæ magnified. b. Two of the feelers seated on the hairy lip. c. The erect horn. d. d. The fore legs strongly dentated.

GENUS II. *LUCANUS*.

GENERIC CHARACTER.

Antennæ clavated; the club compressed, or flattened on one side and pectinated, or cleft like a comb. *Mandibulæ*, or pincers, in the males, are very strong, projecting before the head, and armed with teeth. In the females smaller. The anterior *palpi* have 4 articulations; the posterior 3.

General Observations.

The *larvæ*, or grubs, of the Lucani are large, fat, and white. Their mouth is armed with two strong horny jaws, with which they work their way into the substance of decayed wood. There with the saw-dust they form round their bodies a sort of shell, in which they remain till they pass from the state of a chrysalis to a perfect insect. During this intermediate state, this temporary death which the insect undergoes, all its future parts may be plainly traced. The head is bent and supported on the breast; the wings and wing-cases are short, and not as

yet developed ; the feet are pressed against the body, and the rings of the abdomen may be easily counted.

The Lucani live but a short time in their perfect state. The last change is scarcely completed, before they seek to fulfil the purpose for which nature has designed them, by providing for a future progeny before they die. They are found in the neighbourhood of oak trees, (particularly the *L. Cervus*) being fond of the honied liquor which is so often seen spread upon the leaves.

SPECIFICATION.

LUCANUS ELAPHUS. L. mandibulis exsertis unidentatis apice bifurcatis, labio deflexo conico. *Linn. Syst. Nat. cura Gmelin, p. 1589. Fabr. Syst. Ent. p. 2. No. 3. Sp. Insect. 1. p. 2. Mant. Ins. 1. p. 1.*

Olivier Entomol. 1. p. 12. pl. 3. f. 7.

A North American insect inhabiting Virginia and Maryland.

It greatly resembles the Stag-beetle, but is smaller and differs in colour. Degeer was acquainted with the insect, but thought it a variety only of the *L. Cervus*.
Plate 2.

GENUS III. *DERMESTES*.

GENERIC CHARACTER.

Antennæ clavated, the club perfoliated, the three last articulations thicker or larger than the others, and forming an oblong mass somewhat compressed. *Thorax* convex and very slightly margined. *Head* bent in and nearly concealed under the thorax.

General Observations.

The Dermestes (the bane of collectors) is well known for the havoc it occasions in subjects of natural history susceptible of decay. It is not the perfect insect, but the larva that does the mischief; for after having passed through the usual stages of transformation, it is no longer to be dreaded, except as an agent for the provision of future depredators. The voracity of the larvæ is such that they will entirely destroy quadrupeds, birds, and insects prepared in cabinets for preservation. Among furs they are equally destructive, not only occasioning the hair to fall off, but consuming the very skin. In

the fields they attack the carcasses of dead animals, and consuming the fleshy and tendinous parts, leave nothing but the skeleton behind. It is very difficult to guard against the ravages of these insects. By their minuteness they escape our sight, and by their perseverance our precautions.

The Dermestides, in their perfect state, constantly seek to hide themselves, and seem to shun the impression of light. Their habits are singular, and in a strong degree mark that instinctive faculty with which they are provided for the preservation of life. When they quit their retreats, which is rather from necessity than choice, their motion is timid and uncertain; they seem to fear the very air that breathes upon them, and on the slightest touch suspend their motion, draw in their antennæ and feet, and seem to feel a security from further molestation, in an obstinate and well feigned appearance of death.

The larva may be known when met with by the following description. Its body is composed of twelve very distinct rings: it has a scaly head

provided with two antennæ, and very hard and cutting mandibles. The legs are six in number, each terminated by a nail; the end of the body is remarkable for a tuft of very long hair.

As it must be desirable to find a certain remedy against such a persevering little pest as the Dermestes, it will not be improper to give the following receipt which Olivier found to be sufficiently efficacious, viz. Quick lime, half an ounce; salt of tartar, one dram and a half; camphor, five drams; white soap, four ounces; arsenic, four ounces. Dissolve the camphor in a sufficient quantity of spirit of wine, add the arsenic, the salt of tartar, and the quick lime, beat them together with the soap, and preserve the composition in a pot for use. Olivier was present, with several other Naturalists, at the trial of this receipt. Of several birds enclosed in a box, some were subjected to this preservation. At the end of a year the same persons examined the effect, and found that where the remedy had been used the birds were whole and perfect, while the others were reduced to powder.

SPECIFICATION.

DERMESTES VIOLACEUS. D. nigro cærulescens, thorace villosa, pedibus nigris. *Linn. Syst. Nat. p. 563.*

Gmel. 1594. Fabr. Syst. Ent. p. 56.

Schaeffer, Icon. pl. 166. fig. 4. a. b.

Panzer, Faun. Ins. Germ. fasc. 5. No. 6.

Inhabits Europe, and is sometimes found on flowers.

Pl. 3. a. The D. violaceus of the natural size.

b. The same magnified. c. c. Antennæ.

DERMESTES.



D. violaceus ..



GENUS IV. *PTINUS*.

GENERIC CHARACTER.

Antennæ filiform, very long, of eleven articulations, of which the last are the longest. *Thorax* nearly round, not margined, receiving the head under it.

General Observations.

The Ptini, which are very small insects, are commonly found on walls and in houses; they infest granaries, but are seldom met with in the fields. In their habits they resemble the Dermestides. Like them, when touched they draw in their head, and pressing their antennæ and feet against their body, make a mockery of death, and thus endeavour to escape the danger to which they appear no longer sensible.

The larvæ are provided with six feet. The body, which is covered with wrinkles, is soft, cylindrical, and very lightly downy, the hinder part is curved inwards, giving the larva the appearance of an arch. The head is hard, scaly, and has two very strong little jaws. These in-

sects, like those of the foregoing genus, are very destructive to collections of dried substances, feeding on plants, animals, skins, and other objects which the naturalist is desirous of preserving.

SPECIFICATION.

PTINUS FUR. Pt. testaceus subapterus, thorace quatuor-
dentato, elytris fasciis duabus albis. *Linn.*
Syst. Nat. p. 566. *Gmel.* 1607. *Fabr. Syst. Ent.*
p. 63. *Spec. Ins.* p. 73. *Mant. Ins.* p. 40.

Schæff. Elem. pl. 30.

Frisch. Ins. 13. pl. 15.

Olivier Entomol. vol. 2. No. 17. 3. pl. 1. f. 1. a. b. c.

This insect inhabits the houses in most parts of Europe.

Pl. 4. a. The natural size. b. The same magnified.
c. One of the antennæ. d. A leg.

PTINUS.



P. Fur

HISTER.



H. unicolor.

GENUS V. *HISTER*.

GENERIC CHARACTER.

Antennæ clavated, the club solid; the lowest articulation compressed and bent; the head drawn within the body, so that the jaws only appear. *Mouth* armed with jaws like forceps. *Elytra* shorter than the body; legs compressed, toothed, or spiny.

General Observations.

These insects are found in dung, in carcases and shambles; some species live under the bark of dead and rotten trees. They are met with in spring, summer, and indeed in most parts of the year. Sometimes they are found running on the sand by the road-sides. Like the *Dermestides*, &c. when touched they counterfeit death, till they think the danger past.

SPECIFICATION.

HISTER UNICOLOR. *H. ater*, *elytris oblique striatis*.

Linn. Syst. Nat. p. 567. Gmel. p. 1609. Fabr.

Syst. Ent. p. 52. Spec. Ins. 1. p. 60. Mant. Ins. 1.

p. 32.

Degeer, Ins. 4. p. 342. pl. 12. f. 12.

Schaeffer, Icon. pl. 208. f. 5.

Panzer, Faun. Insect. Germ. fasc. 4. No. 2.

Inhabits sand, earth, and dung, and varies considerably in size.

Pl. 5. a. Natural size. b. Underside magnified. c. The head. d. A horn. e. A leg.

GENUS VI. *GYRINUS*.

GENERIC CHARACTER.

Antennæ cylindrical, club-shaped, stiff, and shorter than the head. *Maxilla* horny, arched and pointed. *Eyes* four in number, two on the upper, and two on the under side of the head.

General Observations.

On the surface of stagnant marsh waters, on lakes, and on ditches, we often see swimming, or as it were running, certain small, black, and shining insects, collected together in numbers, and describing circles with astonishing rapidity. These are Gyrini, which notwithstanding the small space in which so many of them move, and the celerity of their motion, are not often seen to strike against each other. The French, from their circular motion, call them *Tourniquet*; the English, from their lucid surface, *Glimmerchaffer*. This latter name is particularly applicable when the sun shines upon them; then they look like so many brilliant

pearls, moving about in different directions, and reflecting the light in a very pleasing manner. Sometimes they rest as if fatigued with their exertions, and remain without the slightest motion; but on being approached, they instantly strike off to a distance on the surface, or endeavour to save themselves by plunging with equal celerity to the bottom.

Sometimes they remain at the bottom grappling with an aquatic plant; for being lighter than the waters in which they live, it is necessary for them to cling to something while they stay there. When on the surface, the upper part of their body is entirely dry; but when they plunge, a small bubble of air, like a silver ball, remains attached to them, and has a very pretty effect. They have a very strong smell, which exhales from their body, particularly in hot weather, and which leaves a most disagreeable scent upon the fingers after touching them.

The females deposit their eggs on the leaves of aquatic plants. They are very small, long, of a cylindrical shape, and of a white colour. In about eight days the larvæ leave their eggs,

GYRINUS.



G. Nator.

and take to the water; they are of a dirty white or rather greyish colour, have a long cylindric body, six legs, and at first sight resemble the Scolopendra. About the beginning of August, the larvæ leave the water, and climb up the large leaves of the reeds which grow on the banks; there they prepare for their transformation, by covering themselves with a matter like grey paper, which they spin from their bodies; and in this case they remain, in the chrysalis state, till near the end of the same month, when they issue from their temporary tomb, and instantly leap into the water. That principle of mutual destruction, which exists throughout all the branches of animated nature, leads the Ichneumon to lay its eggs near the chrysalis of the Glimmerchaffer, that its larvæ may not be in want of food as soon as they appear.

SPECIFICATION.

GYRINUS NATATOR. Gy. substriatus. *Linn. Syst. Nat.* 1. p. 567. *Gmel.* p. 1611. *Fabr. Syst. Ent.* 1. p. 234. *Spec. Ins.* 1. p. 297. *Mant. Ins.* 1. p. 194. *Roesel. Ins.* 3. pl. 31. f. 1—6.

Schaeffer, Icon. Ins. pl. 134. f. 5. a. b.

Schaeffer, Elem. t. 17.

Panzer, Faun. Ins. Germ. fasc. 3. No. 5.

Inhabits the still waters of Europe.

Pl. 5. a. Natural size. b. The same magnified.
c. The head. d. A horn. e. A leg.

GENUS VII. *BYRRHUS*.

GENERIC CHARACTER.

Antennæ clavated; the club perfoliated. *Palpi* equal and a little clavated. *Maxilla* and lip bifid.

General Observations.

Linnæus at first placed these insects with the Dermestides, but afterwards separated them, and formed a distinct genus under the name of *Byrrhus*. Geoffroy had already established the genus by the name of *Cistela*, a name which Linnæus rejected, but which Fabricius has since given to insects very different from these.

The Byrrhi are oval insects, and some of the species are convex, or subglobular, and have the wing covered by a short pile or down; they are met with in fields, road-sides, and other similar places. Their wings, which are completely hid under the wing-cases, are rarely used. When touched they draw their head beneath the corselet, contract their antennæ and legs, and counterfeit death.

SPECIFICATION.

BYRRHUS PILULA. B. fuscus; elytris striis atris interruptis. *Linn. Syst. Nat. p. 568. Gmel. 1612. Degeer, Ins. 4. p. 213. pl. 7. f. 23, 24 Schaeffer, Elem. Ins. t. 45. Schaeffer, Icon. Ins. t. 95. f. 5.*

Inhabits Europe, and is found in sandy soils, and on various plants, about garden-grounds, &c. It takes its name from its resemblance to a pill, which it assumes when disturbed. The Antennæ in this species are longer than in others, and have not the same clubbed appearance.

Pl. 7. a. Natural size. b. Magnified. c. The head. d. A horn.

BYRRHUS.



B. Pilula.

GENUS VIII. *SILPHA*.

GENERIC CHARACTER.

Antennæ clavated ; the club perfoliated. *Elytra* margined ; *Head* prominent. *Thorax* flat-tish and margined.

General Observations.

The *Silphæ* are insects whose strong and disagreeable smell indicates the places they inhabit, and the substances upon which they feed ; they, as well as many other insects, are of use to absorb the putrid flesh and excrementitious substances, which might otherwise infect the air. Their instinctive faculty leads them eagerly to seek the dead bodies of small animals, and it is singular to see them, attracted from a considerable distance by the smell of a putrid body, associate in their enterprize, and combine their efforts, that they may peaceably enjoy the fruits of their labours. Corruption has scarcely commenced in a mole or a mouse, and the smell become offensive, before

numbers collect together, and gliding under the animal, work with great activity, removing the earth, till by degrees the body disappears, and is buried without our seeing the workmen, or observing how it is effected. Four or five of these insects will thus entomb a mole in less than twenty-four hours. When it is once completely under the surface, they enter the body and feed without fear.

The Larvæ, which are born in corruption, are of a greyish white colour, with a brown head. The body has twelve divisions with a rusty scale between each. They have six small scaly feet attached to the three first rings of the body. The larva in due time buries itself in the ground, forms an oval cell, turns to a yellowish chrysalis, from which in about three weeks proceeds the perfect insect.

SPECIFICATION.

SILPHA GERMANICA. *S. oblonga atra, clypeo obrotundo inæquali marginato, elytris obtusissimis margine laterali ferrugineis.* *Linn. Syst. Nat. p. 569. Gmel. p. 1615.*

SILPHA.



S. germanica.

Nicrophorus germanicus. *Olivier Entom. No. 10.*

pl. 1. f. 2. a. b.

Panzer, Faun. Ins. Germ. fasc. 41. t. 1.

Is found in Germany and the North of Europe,
inhabiting putrid substances.

Plate 8. a. One of the antennæ magnified.

GENUS IX. *CASSIDA*.

GENERIC CHARACTER.

Antennæ moniliform, thickening towards the tip. *Head* concealed beneath the thorax. *Thorax* flat and margined. *Elytra* with a broad margin. *Tarsi* with 4 articulations.

General Observations.

The *Cassida* is called tortoise beetle, from a general resemblance which it bears to that reptile, when laid upon its back. The genus is numerous, and contains many species of great beauty. The *Cassidæ* are readily distinguished from any other of the Linnæan genera, by the singular manner in which the thorax and wing-cases cover the head and body. The *Coccinellæ*, perhaps, approach them nearest in appearance, but may be easily distinguished, inasmuch as the *Tarsus* of the latter has but three articulations instead of four.

The *Cassidæ* live on plants. They are seldom seen running, and still more rarely in flight. The fine golden, or silver colours, with which

many of the exotic species are adorned, disappear, it is true, when the insects are dead and kept in cabinets, but which may be made to re-appear by soaking the insect in hot water, about a quarter of an hour. The larva is often found on the same plant by the side of the perfect insect. It eats the under side of the leaves, and is often, as it were, hid under a cover of its own excrement. This larva is of a very singular appearance, and has been described and figured by Reaumur, Goedard, Roesel, Geoffroy, Degeer, &c. It is soft, of an oval shape, and yellowish brown colour. It has six scaly feet, and the body is edged with spines, of which the two last are the longest. When it is at rest the head and feet are entirely concealed under the body; and when in motion the two terminal spines, or fibres, are carried in an upright position. Previous to the change, it fixes itself to a leaf by a glutinous exhalation, which exudes from its body for the purpose, and then becomes a chrysalis of a very unusual appearance. It is shorter than the larva, of a flat oval figure, with an ample fringed corselet, beneath which

is hidden the head. In fifteen days the perfect insect ruptures the anterior and upper part of the skin, which it leaves sticking to the leaf, and proceeds in the appointed time, to deposit a row of eggs to perpetuate a future progeny.

SPECIFICATION.

CASSIDA VIRIDIS. C. *Linn. Syst. Nat.* 1. p. 574.

Gmel. 1635. C. equestris. *Fabr. Syst. Eleuth.* 1.

p. 388. *Mant. Ins.* 1. p. 62. *Syst. Ent.* 1. p. 292.

Schaeffer, Icon. t. 27. f. 5.

Panzer, Faun. Ins. Germ. fasc. 96. No. 5.

Inhabits Europe, and is frequently found on thistles and verticillated plants.

Pl. 9. fig. a. Natural size. b. Magnified. c. A horn.
d. The leg.

CASSIDA.



C. viridis.

GENUS X. COCCINELLA.

GENERIC CHARACTER.

Antennæ subclavated, *i. e.* increase a little in thickness towards the end. *Palpi* club-shaped, and somewhat heart-shaped. *Body* hemispherical. *Thorax* and *elytra* margined. *Abdomen* flat.

General Observations.

The Coccinellæ, which are very pretty insects, have their brilliant wing-cases so closely applied to each other, that they appear like a shining vault of one piece. They do not vary much in colour, but they have for the most part an agreeable and regular arrangement of spots which serve to distinguish the species from each other. A principal character in the insects of this genus is their hemispherical figure, which is at no time more apparent than when they lower their head and draw in their legs on being touched. Upon these occasions they distil from the end of their thighs a drop of yellow mucilaginous liquor, of a very strong and stinking

smell, well known to children while playing with their favourite Lady Birds. The *Coccinellæ* feed on the *Aphides*, and are found on all sorts of plants and trees infested with their food. They survive the winter, and are the first insects that appear in the spring.

The larva is of a long oval shape, divided into twelve rings, and terminating in a sharpened tail. The surface is hairy. The feet are scaly and six in number. It has a small head with two short antennæ. These larvæ are very voracious, and destroy vast numbers of *Aphides*. They also prey upon each other, so that it is rather dangerous for the small and feeble, to associate with those of their brethren of a proper size and strength.

The chrysalis is prettily spotted with black and other colours. It moves its head from time to time, particularly when touched, and occasionally raises itself on end, and remains some moments in that position. The *Coccinella* when first it bursts its sheath, to assume the perfect insect, is entirely of a dirty or yellowish white colour, and of a soft and flexible consistence;



COCCINELLA.



C. septempunctata.

but in proportion as it hardens by the action of the air, the spots begin by degrees to appear. The under part of the body also, is at first of the same yellowish white, till in the course of a few hours it changes to black, yellow, or red, according to the species it is designed to represent.

SPECIFICATION.

COCCINELLA SEPTEM PUNCTATA. *Coc. coleoptris rubris, punctis nigris septem.* *Linn. Syst. Nat.* 1. p. 581. *Gmel.* p. 1649. *Fabr. Entom. Syst.* 1. p. 274. *Spec. Ins.* 1. p. 96. *Mant. Ins.* 1. p. 57.

Geoff. Ins. 1. p. 321. t. 6. f. 1.

Roesel. Ins. 3. t. 31. f. 18.

Panzer, Faun. Ins. Germ. fasc. 79. pl. 5.

Inhabits all Europe, and is found on trees and plants, also in the windows of houses in particular years. This is the well-known Lady Bird, the common amusement of children.

Pl. 10. a. Natural size. b. Magnified. c. The head. d. A horn. e. A leg.

GENUS XI. *CHRYSOMELA*.

GENERIC CHARACTER.

Antennæ moniliform, or composed of little globular articulations, which grow larger towards the end, and somewhat resemble a necklace of beads. *Palpi* six, thickest at the extremity. *Thorax* margined, but not the elytra. *Body* more or less oval and very convex.

General Observations.

Linnæus found this genus so extensive, that he has divided it into five families, viz. :—

1. With bodies of an oval form.
2. With hinder legs thicker than the others, and made for leaping.
3. With bodies of a cylindrical shape.
4. Of an oblong form, with the thorax broader or wider than the abdomen.
5. Of a long and slender shape, with the thorax the same length as the abdomen.

Many of these insects bear a very strong af-

finity to the Cassidæ and Coccinellæ; but the thorax and large elytra of the former, and the antennæ, increasing in size towards the end of the latter, sufficiently distinguish them from the species of this genus. The Chrysomelæ in general are very small insects; the largest not exceeding half an inch in length. Many of them are enriched with the most beautiful colours, such as scarlet, azure, blue, golden green, &c. One of them, the *Chrysomela Populi*, very much resembles our Lady Bird. It is about twice the size, and is of a bright red colour, with the tips of the wing-cases black, and the thorax of a greenish black. The Chrysomelæ live on trees and plants, feeding on their leaves, and there depositing their eggs. In some species the female is so prolific, and the abdomen so distended with eggs, that it is hardly covered by the elytra.

The larvæ have six long scaly feet, and an oblong oval body, divided into rings, and ending in a fleshy knob, which serves for a seventh leg; and not only assists them in their motion, but being commonly covered with a glutinous

matter, is also of use to fix the larva to the leaf. Several species of these larvæ occupy one and the same leaf, which they quietly gnaw together. When about to be transformed, which happens in the month of June, they fix themselves by their glutinous knob to a leaf, and the chrysalis, in about a fortnight, gives way for the perfect insect.

SPECIFICATION.

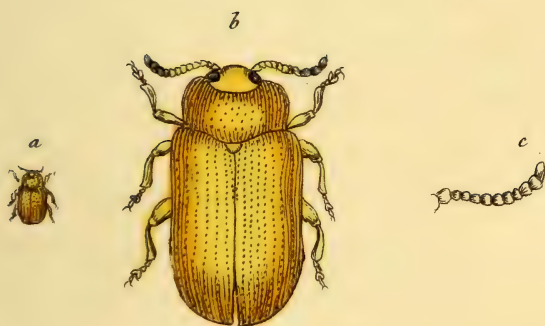
CHRYSOMELA PALLIDA. Ch. ovata, flavescens, oculis nigris. *Linn. Syst. Nat.* 1. p. 589. *Gmel.* 1. p. 1676. *Fabr. Syst. Ent.* p. 99. *Spec. Ins.* 1. p. 122. *Mant. Ins.* 1. p. 70.

Panzer, Faun. Ins. Germ. fasc. 78. t. 4.

Inhabits the willow, birch, ash, &c. Fabricius considered this species to be the same as the black-eyed *Crioceris* of Geoffroy, 1. p. 243, but Olivier and Panzer are of a different opinion.

Pl. 11. a. Natural size. b. The same magnified. c. A horn.

CHRY SOMELA.



C. pallida.

GENUS XII. *HISPA*.

GENERIC CHARACTER.

Antennæ spindle-shaped, *i. e.* gradually thickening from each extremity towards the middle; approximating at the base, and situated between the eyes. *Maxilla* bifid, the exterior division very small. *Palpi* four, short and filiform. *Thorax* and *Elytra* in general aculeated. *Tarsi* with four articulations, the third large and bilobate, the two first triangular.

General Observations.

The insects belonging to this genus have an oblong body, in some species covered with little spines; in others, striated, rough, or shining. Of their habits and manners but little is known. They live on different plants, and some species are found on the upper stems of grasses, from whence they fall voluntarily the moment you attempt to seize them. Olivier found one species in the South of France on a *Cistus*. Nothing is known at present of the larva.

SPECIFICATION.

HISPA MUTICA. *H. inermis*, antennis pilosis. *Linn.*

Syst. Nat. p. 604. *Gmel.* 1732.

Tenebrio hirticornis. *Degeer*, 5. p. 47. t. 3. f. 1.

Ptilinus muticus. *Fabr. Ent. Syst.* 4. *App.* p. 445.

Panzer, Faun. Ins. Germ. fasc. 1. t. 8.

Inhabits Europe, in sand and on grass. The antennæ are black, with eight articulations, and very hairy.

Pl. 12. a. Natural size. b. Magnified. c. A horn.

HISPA.



H. mulica.



GENUS XIII. *BRUCHUS*.

GENERIC CHARACTER.

Antennæ filiform, with eleven articulations, growing somewhat thicker towards the extremity. *Mandibulæ* simple. *Maxillæ* bifid. *Palpi* four, filiform; the two anterior with four articulations, the posterior with three. *Tarsi* with four articulations; the two first triangular, the third bilobate.

General Observations.

It was not till after the tenth edition of the *Systema Naturæ*, that Linnæus separated these insects from among the Dermestides and Curculiones, and established them as a separate genus, under the name of *Bruchus*. Geoffroy has given them the name of *Milabris*, which has not, however, been adopted by succeeding entomologists.

The larvæ have a short, thick, arched body, with a small scaly head, and two hard, cutting mandibles; they have nine *stigmata*, or air vents, on each side.

These larvæ are very destructive to the seeds of leguminous plants, and often do great mischief to the fields of peas. The larva passes the winter in the seed, and the perfect insect appears in the spring. In this state their habits are quite altered, they have no longer any taste for peas, the food which formerly supported them is wholly disregarded, and they now derive their nourishment from the flowers of different plants. As soon as that propensity, which leads all animals to seek each other, is satisfied, the Bruchi return to the young pods, just as they are ready to be formed, and generally deposit an egg in the embryo of each pea.

SPECIFICATION.

BRUCHUS PISI. Br. elytris griseis albo punctatis, podice albo maculis binis nigris. *Linn. Syst. Nat.* 1. p. 604. *Gmel.* p. 1734. *Fabr. Syst. Ent.* p. 64. *Spec. Ins.* 1. p. 74. *Mant. Ins.* 1. p. 41. *Geoffroy, Ins.* 1. p. 267. t. 4. f. 9. *Degeer*, 5. t. 16. f. 3, 4. *Panzer, Faun. Ins. Germ. fasc.* 66. t. 11.

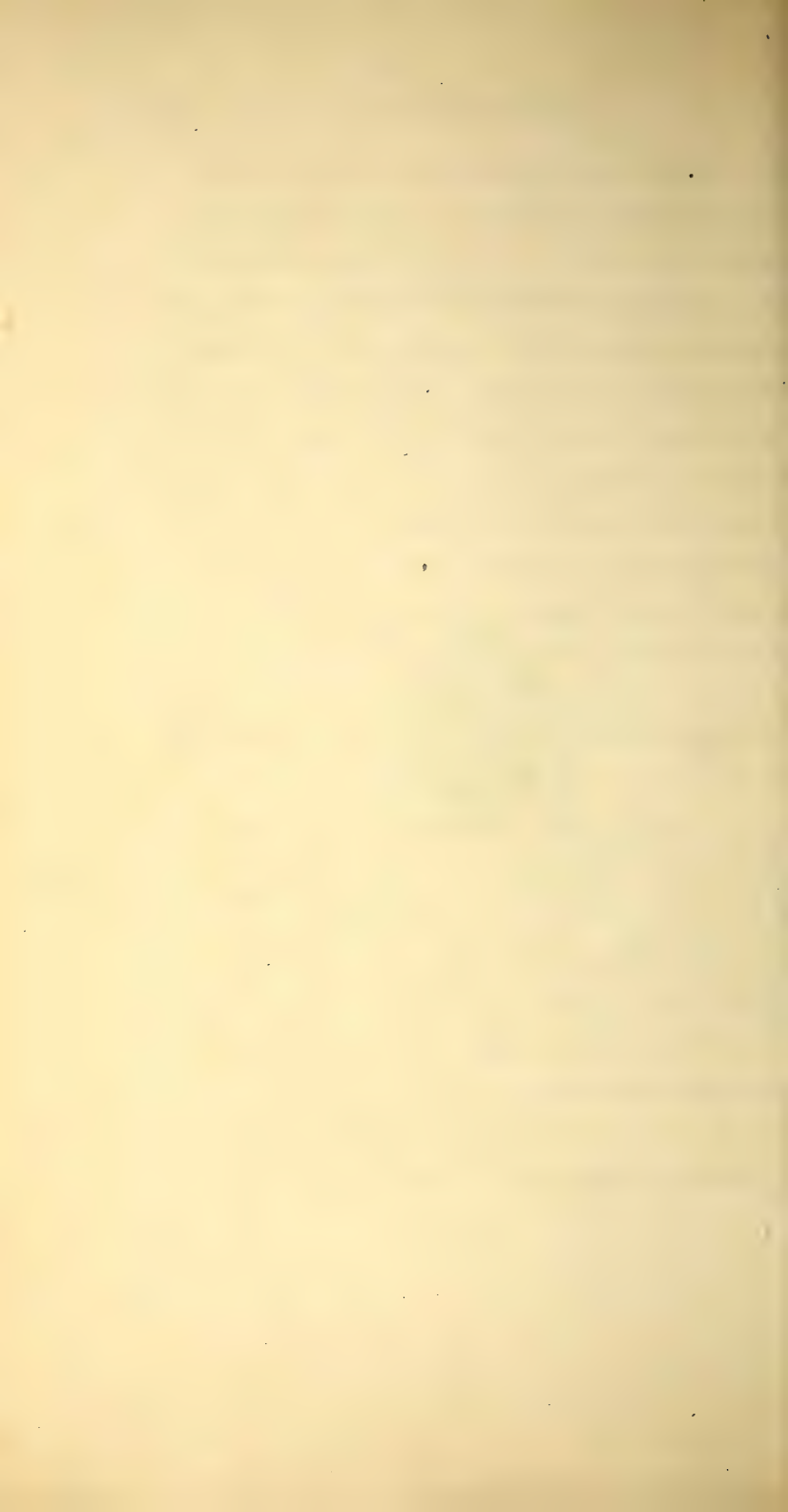
Inhabits Europe, and is destructive, in the larva state, to beans and peas.

Pl. 13. a. Natural size. b. Magnified. c. A horn.

BRUCHUS.



B. Pisi



GENUS XIV. *CURCULIO*.

GENERIC CHARACTER.

Antennæ bent, first articulation long; the three last subclavated. *Head* more or less lengthened into the form of a trunk. *Palpi* four, short, setaceous; the anterior composed of four, and the posterior of three articulations. *Tarsi* with four articulations; the two first short, triangular; the third bilobate.

General Observations.

Linnæus has divided the Curculiones into the following sections:

1. With the rostrum longer than the thorax, and the thighs simple, without teeth or spines.
2. With the rostrum longer than the thorax, and the thighs dentated.
3. With dentated thighs and the rostrum shorter than the thorax.
4. With the thighs simple, and the rostrum shorter than the thorax.

Of this genus, which is very numerous, there is one species more particularly injurious to man; it is the *Curculio granarius* or Weevil, the female of which deposits an egg while they last in each grain of wheat, to the utter destruction of the seed. The egg, which is very minute, in about a week produces a little white maggot, that fattens in its farinaceous dwelling, till it is ready to become a chrysalis. In about eight or ten days after this, the insect appears in its perfect form, of a dull reddish brown colour, and scarcely one sixth of an inch long.

Another kind infests the hazel nut, and to our great disappointment, often leaves us little but the shell. The insect, which is the *Curculio nucum*, may be found in August, creeping about the hazel-trees, and choosing such nuts as suit her purpose. Into these she first bores a hole with her proboscis, and then turning round deposits an egg in the cavity. Thus she passes on from nut to nut, performing the same operation, till she has emptied her ovary. The nut, without being injured by the wound, increases to maturity, while the mag-

CURCULIO.



C. Baccus.

got within is living on its contents. Some time after the fall of the nut, the larva creeps out at a hole which it gnaws for the purpose, buries itself in the ground, and remains dormant during the long winter months: it then becomes a chrysalis, and finally, in the beginning of August, issues from the earth to make the most of that short space of time generally allotted to the insect tribe in their perfect state.

The *Curculio imperialis*, or Diamond Beetle, is the most beautiful of the tribe, and well known for the rows of brilliant spots with which the wing-cases are covered.

SPECIFICATION.

CURCULIO BACCHUS. Cur. longirostris aureus, rostro plantisque nigris. *Linn. Syst. Nat. p. 611.*

Gmel. 1. p. 1752.

Fabr. Ent. Syst. 2. p. 387.

Attelabus Bacchus.

Schaeff. Icon. Ins. pl. 37. f. 13.

Panzer, Faun. Ins. Germ. fasc. 20. t. 5.

Inhabits Europe.

Pl. 14. a. Natural size. b. Magnified.

GENUS XV. *ATTELABUS*.

GENERIC CHARACTER.

Antennæ thickening towards the tip. *Head* broader before than behind, or tapering gradually from the prominent eyes towards the thorax. *Palpi* four, short. *Tarsi* with four articulations; the third bilobate.

General Observations.

The larvæ of the Attelabi are white, soft, and without feet. They live entirely on vegetable substances, attacking the leaves, flowers, fruits, and stems of plants. They change their skin several times, and when full grown, spin a strong silken case, in which they become a chrysalis, and at the appointed time a perfect insect. When these larvæ are numerous, they make great havoc among the vegetables, either eating the leaves, attacking the young shoots, or gnawing the flowers and fruits.

SPECIFICATION.

ATTELABUS BETULA. At. pedibus saltatoriis, corpore toto atro. *Linn. Syst. Nat.* 1. p. 610. *Gmel.*

ATTELABUS.



A. Betula

1810. *Fabr. Ent. Syst.* 2. p. 392. *Spec. Ins.* 1.
p. 201.

Degeer, Ins. 5. p. 259.

Panzer, Faun. Ins. Germ. fasc. 20. t. 15.

Inhabits the birch, and gnaws the edges of the leaves.

Pl. 15. a. Natural size. b. Magnified.

GENUS XVI. CERAMBYX.

GENERIC CHARACTER.

Antennæ slender, setaceous. *Thorax* either spiny or gibbous. *Elytra* narrow, sublinear. *Tarsi* with four articulations; the third bilobate.

General Observations.

Linnæus has divided this genus into the following sections :

1. Thorax armed on each side with moveable spines.
2. Thorax margined, and sides spiny.
3. Thorax round, armed with fixed spines.
4. Thorax subcylindrical and without spines.
5. Thorax roundish, without spines, and of a depressed globular shape.

The insects of this genus, which are very numerous, are easily known by the figure and position of their antennæ, and the number of articulations of which the tarsi are composed. Many of them are particularly distinguished

for the beauty and variety of their colours. Their body is elongated, and the antennæ differ in length in the same species, the males having generally the longest. When taken they try to defend themselves, and make a sharp noise by rubbing the thorax briskly against the scutellum. Cerambyces are generally found in woods, and on the trunks of trees; rarely on flowers.

The female has a slit at the end of the body, through which she can exert a long black cylindrical trunk, which in general is concealed; but which, upon pressing the abdomen, may be forced out. This trunk, which appears to be composed of two pieces sliding within each other, is terminated by two long and very delicate cartilaginous filaments. It is by this channel that the insect deposits her eggs, after having made a hole in the wood for that purpose.

The larvæ have a soft, long body, with thirteen rings, and a hard scaly head. They change their skin several times; and at the end of two or three years change into a chrysalis, from which proceeds the perfect insect.

SPECIFICATION.

CERAMBYX HISPIDUS. Cer. thorace spinoso, elytris subpræmorsis, punctisque tribus hispidis, antennis hirtis longioribus. *Linn. Syst. Nat.* p. 627. *Gmel.* p. 1821. *Fabr. Syst. Ent.* p. 169. *Spec. Ins.* 1. p. 215. *Mant. Ins.* 1. p. 134.

Geoff. Ins. 1. p. 206.

Schaeff. Icon. t. 176. f. 5. a. 5, b.

Panzer, Faun. Ins. Germ. fasc. 14. t. 16.

Inhabits Europe, and is found in orchards and pastures.

CERAMBYX.



C. hispidus.



GENUS XVII. *LEPTURA*.

GENERIC CHARACTER.

Antennæ setaceous, tapering towards the end.

Palpi four, filiform. *Elytra* diminishing in breadth towards the apex. *Thorax* somewhat cylindrical. *Tarsi* with four articulations.

General Observations.

The insects of this genus greatly resemble those of the preceding. Their habits and manners are much the same. They are found in the woods, on the trunks of trees, and on flowers. Their larvæ feed on decayed wood. Many of the species can boast of great beauty in the decorations of their wing-cases; some are banded, and some are spotted with very decided and brilliant colours.

SPECIFICATION.

LEPTURA MYSTICA. L. thorace globoso tomentoso, elytris fusco-cinereis, antice rufis: fasciis line-

aribus arcuatis lataque canis. *Linn. Syst. Nat.*
p. 369. Gmel. p. 1855.

Callidium mysticum. Fabr. Entom. Syst. vol. 2.
p. 337. Spec. Ins. 1. p. 244. Mant. 1. p. 156.
Schaeff. Icon. t. 2. f. 9.

Panzer, Faun. Ins. Germ. fasc. 82. t. 9.

Inhabits Europe, and is found in gardens and pastures.

LEPTURA.



L. mystica.

NECYDALIS.



N. minor.

GENUS XVIII. *NECYDALIS*.

GENERIC CHARACTER.

Antennæ setaceous. *Palpi* four, filiform. *Elytra* smaller or shorter than the wings. *Tarsi* with four articulations; the third large and bilobate.

General Observations.

The wing-cases being so much shorter than the wings in the *Necydalis*, forms a character which at once distinguishes this genus from the preceding.

No one has observed the metamorphosis of these insects, but it may be presumed from analogy, that the larvæ live in the substance of wood; since Degeer remarked a conical trunk at the end of the abdomen in one species, similar to that in the *Cerambyx*, and probably given to the insect for the same purpose.

SPECIFICATION.

NECYDALIS MINOR. *N. elytris* testaceis, apice lineola alba, antennis corpore longioribus. *Linn. Syst. Nat.* p. 641. *Gmel.* 1878.

Molorchus dimidiatus. *Fabr. Ent. Syst.* 1. p. 357.

Syst. Eleut. 2. p. 375.

Schaeff. Icon. t. 95. f. 5.

Panzer, Faun. Ins. Germ. fasc. 41. t. 21.

Inhabits Europe, and is a common species in fields and about hedges, in the summer.

Pl. 18. a. Natural size. b. Magnified. c. A leg.

GENUS XIX. *LAMPYRIS*.

GENERIC CHARACTER.

Antennæ filiform. *Palpi* four, unequal; the anterior with four articulations; the posterior with three. *Elytra* weak and flexible. *Thorax* flat and semiorbicular, concealing the head. *Abdomen* with the side plaited into papillæ. Female (in most species) without wings.

General Observations.

This is a remarkable genus of insects, on account of the phosphoric light which the females of all the species emit during the night. On the under side of two or three rings of the abdomen may be seen certain yellow spots, from whence in the dusk of evening proceeds a light, which at a distance looks like a shining spark, or very brilliant little star. The quantity of light produced will be in proportion to the vigour of the insect; it diminishes with its strength, and is lost with its life.

In some species, the male as well as the fe-

male is luminous; and in Italy, the flying glow-worm, *Lampyrus Italica*, is so common, that, according to Olivier, in a summer evening, soon after sunset, the air is filled with them; and, as the darkness increases, they look like so many falling stars. There is no walking in the meadows in a fine summer-night, without being surrounded by these sparks of fire, shooting in all directions; and appearing or disappearing, as the insect is on the wing or at rest. The first impression of such a scene is said to be beyond description.

The common glow-worm of this country is a very sluggish insect, seeming to drag itself along, rather than to walk. From the want of wings it is denied the power of flight, and doomed for ever to remain upon the earth. In the summer, till the end of August, these little lamps may be seen shining on dry banks, about woods, in the meadows, or along the bottoms of our hedges. There is but little difference in the appearance of the larva, chrysalis, and complete female insect; but the light is strongest in the latter. The eggs, which are as large as a rape-

LAMPYRIS.



L. Noctiluca.

seed, are round and of a straw colour. When first emitted they are covered with a glutinous secretion, which fixes them to the turf or grass, where they are destined to remain.

SPECIFICATION.

LAMPYRIS NOCTILUCA. *L. oblonga fusca*, clypeo cinereo. *Linn. Syst. Nat.* p. 643. *Gmel.* p. 1882. *Fabr. Syst. Ent.* 1. p. 200. *Spec. Ins.* 1. p. 251. *Mant.* 1. p. 161.

Degeer, Ins. 4. p. 31. t. 1. f. 19, 20.

Panzer, Faun. Ins. Germ. fasc. 41. t. 7.

Inhabits Europe, and is found in fields and woods.

The female is wingless, and is the common glow-worm.

Pl. 19. a. Natural size. b. Magnified. c. A horn.

d. A leg.

GENUS XX. *CANTHARIS*.

GENERIC CHARACTER.

Antennæ setaceous. *Thorax* margined and shorter than the head. *Elytra* flexible. *Abdomen* plaited into papillæ on the sides.

General Observations.

Linnæus has divided the *Cantharides* into two sections. In the first the thorax is depressed, in the second it is rounded.

These insects are commonly found upon flowers, but they are said not to live entirely on the honey which the nectaries produce, being observed occasionally to attack and devour other insects of a smaller size than themselves. Some of them (such as Fabricius has classed under the genus *Malachius*), present a singularity in their formation, which must not be passed unnoticed. When they are taken up in the hand and examined, two red, inflated, soft, and irregular vesicles, composed of three lobes, will be seen to issue from each side the thorax and abdomen. These four vesicles, upon

CANTHERIS.



C. aenea.

setting the insect at liberty, collapse and disappear, leaving a red spot only to mark the place. It would be difficult to say for what purpose these vesicles are formed, since the deprivation of one or all of them, neither affects the life, nor makes any difference in the habits of the insect.

The larva of the *Cantharis* is but little known. It lives in decayed wood, and according to the late Mr. Curtis, resembles that of the *Cerambyx*.

SPECIFICATION.

CANTHARIS ÆNEA. C. corpore viridi aeneo, elytris extrorsum undique rubris. *Linn. Syst. Nat.* p. 648.

Gmel. p. 1897.

Malachius æneus. *Fabr. Ent. Syst.* 1. p. 221. *Syst.*

Ent. 1. p. 207. *Spec. Ins.* 1. p. 262. *Mant.* 1. p. 169.

Degeer, 4. p. 45. t. 2. f. 16, 17.

Schaeff. Icon. t. 13. f. 12, 13.

Panzer, Faun. Ins. Germ. fasc. 10. t. 2.

Inhabits Europe. Is found on flowers and thistles, in May; and is provided with lateral vesicles, which it raises and depresses alternately.

Pl. 20. a. Natural size. b. Magnified. c. The head and thorax. d. A horn. e. A leg.

GENUS XXI. *ELATER*.

GENERIC CHARACTER.

Antennæ setaceous. *Palpi* four, with the last articulation hatchet-shaped; an elastic spine projecting from the breast, or under side of the thorax. *Tarsi* with five articulations.

General Observations.

The spines at the end of the thorax strongly mark the species belonging to this genus, but not so the antennæ, as described by Linnæus; since, in some of the species they are filiform, in others pectinated, and in some serrated.

Many of the coleopterous insects find it very difficult to restore themselves when laid on the back. The singularly curious apparatus with which the insects of this genus are provided for that purpose, was well known to Geoffroy; and is thus described in the Elements of Natural History. An elastic spring or spine projects from the hinder extremity of the breast, and there is a groove or cavity in the anterior part of the abdomen. When laid on its back,

the insect raises and sustains itself on the anterior part of the head, and the extremity of the body, by which means the spine is removed from the groove where it is lodged, when in its natural position; then suddenly bending its body, the spine is struck with force across a small ridge or elevation, into the cavity from whence it was withdrawn, by which shock, the parts of the body before sustained in the air, are so forcibly beat against whatever the insect is laid on, as to cause it to spring or rebound to a considerable distance. A cavity, first observed by Geoffroy, is scooped out of the under side of the head and thorax, in which the antennæ are lodged, that they may not be injured by the fall when the insect makes its singular leap.

Among the Elateres there is one, the *Elater noctilucus*, which, like the *Lampyris*, is remarkable for a similar faculty. This insect, which is found in America, and particularly in Jamaica and St. Domingo, emits so bright a light from two yellow spots in the thorax, that when eight or ten of them are confined in

a glass vessel, they give collectively as much light as a candle. In the day time these insects remain dormant, but in the night they may be seen flying about on all sides. The women work by their light, and the Indians use them fastened to their sandals in their nocturnal excursions. Brown observes that the whole internal part of the insect is luminous, but that the light can escape only by the two spots in the thorax.

The larvæ are but little known. The wire-worm, so destructive to the roots of grass, is said to be the larva of the *Elatér obscurus*.

SPECIFICATION.

ELATER BALTEATUS. E. thorace atro, elytris antice dimidiato rubris, corpore nigro. *Linn. Syst. Nat.* 1. p. 654. *Gmel.* p. 1906. *Fabr. Syst. Eleuth.* 2. p. 239. *Spec. Ins.* 1. p. 271. *Mant.* 1. p. 174. *Ent. Syst.* 2. p. 229.

Schaeff. Icon. t. 77. f. 2.

Panzer, Faun. Ins. Germ. fasc. 93. t. 9.

Inhabits Europe, and is found in underwood.

Pl. 21. a. Natural size. b. Magnified. c. A feeler. d. Antennæ. e. e. The legs.

ELATER.



E. balteatus.



GENUS XXII. *CICINDELÆ*.

GENERIC CHARACTER.

Antennæ setaceous. *Palpi* six, filiform, and unequal. *Mandibulæ* projecting far before the head, and toothed. *Eyes* round and prominent. *Thorax* roundish and margined. *Tarsi* with five articulations.

General Observations.

The *Cicindelæ* greatly resemble the *Carabi* in the form of the antennæ, the number of the palpi, and the appendix at the base of the posterior thighs; but they may be distinguished by the prominent eyes, and the form of the thorax, which in the *Carabi* is heart-shaped and truncated at the end.

The *Cicindelæ* are carnivorous; and such is their voracity, that they are waging continual war with those unlucky insects, which have the misfortune to come within their reach, without the strength to contend with them. The provision which Nature has made to further their pursuits, and which strongly marks for what

they were designed, may be seen in the organization of their mandibles. They are large, arched, strongly toothed, and come together when the mouth is closed ; but the moment the insect calls them into action, they fly open, separate to a considerable distance, and seize their prey with a pinch not to be resisted.

The *Cicindelæ* are very active, running along the ground with great celerity. They often use their wings in fine warm weather, but never fly far without settling. In general they are found in dry and sandy places.

The larvæ are cylindrical, soft and whitish ; they have six legs, a sort of scale or plate on the top of the head, and a mouth armed with two strong jaws. Their appetite is the same as that of the perfect insect ; they are equally voracious, but being less active, are obliged to use the following stratagem to secure their prey. The larva digs a deep cylindrical hole in the ground, making the opening perfectly round, which it exactly fills with the scaly plate on the top of its head, so that the surface of the ground appears perfect. In this state, the larva waits with the

CICINDELA.



C. hybrida.

utmost patience, till some unwary insect passing over its retreat, is seized on a sudden by its strong jaws, and forced to the bottom of the hole to be devoured at leisure.

SPECIFICATION.

CICINDELA HYBRIDA. C. subpurpurascens, elytris fascia lunulisque duabus albis. *Linn. Syst. Nat.* p. 657. *Gmel.* p. 1921. *Fabr. Syst. Ent.* p. 224. *Spec. Ins.* 1. p. 283. *Mant. Ins.* 1. p. 185.

Degeer, 4. p. 115. t. 4. f. 8.

Schaeff. Icon. t. 35. f. 10.

Inhabits Europe, and is found in dry sandy places.

Pl. 22. a. The mandibles. b. Antennæ. c. Palpi.
d. Elytron. e. A leg.

GENUS XXIII. *BUPRESTIS*.

GENERIC CHARACTER:

Antennæ filiform, serrated, somewhat shorter than the thorax. *Palpi* four, filiform, with the last articulation truncated. *Mandibulæ* short, horny, with cutting edges. *Head* half buried beneath the thorax. *Tarsi* with five articulations; the four first heart-shaped; the last elongated.

General Observations.

Linnæus has divided these insects into three families.

In the first, the elytra are raised at the suture.

In the second, they are serrated towards the apex; and

In the third they are entire.

There is no genus of the order Coleoptera that can boast of so many brilliant insects as this. The species are, for the most part, enriched with such glowing and beautiful colours, that in the same individual we may often meet with

the pure tints of the rainbow shining with the brightest metallic lustre.

The Buprestides are not numerous in the North of Europe; but they are common in the southern provinces, and abound in the hot climates of both hemispheres. From Asia and South America, many beautiful species are obtained; among others, the largest of the genus, the *Buprestis gigantea*, which is two inches and a half long, and of a fine metallic bronze, like polished bell-metal.

The larva of the Buprestis is not known; but it may be reasonably supposed to live in wood, since Olivier found the *B. mariana* dead on the trunk of the *Pinus maritima*, and the *B. octoguttata* dead in a hole made in the *Pinus silvestris*.

The Buprestides are sluggish on the ground, but active on the wing, particularly when the weather is fine and warm. They are generally found on trees, bushes, plants, or flowers; and some will fall, as it were, dead to the ground, to avoid being taken.

SPECIFICATION.

BUPRESTIS MARIANA. Bu. elytris serratis longitudinaliter rugosis: maculis duabus impressis, thorace sulcato. *Linn. Syst. Nat.* p. 660. *Gmel.* p. 1929. *Fabr. Syst. Ent.* p. 210. *Spec. Ins.* 1. p. 276. *Mant.* 1. p. 178.

Degeer, 4. p. 123. t. 4. f. 18.

Schaeff. Icon. t. 49. f. 1.

Inhabits most parts of Europe, Siberia, and North America, and is found on the trunks of decayed and worm-eaten fir-trees, &c.

Pl. 23. a. The head. b. A horn. c. The thorax. d. A leg.

BYPRESTIS.



B. mariana.



GENUS XXIV. *DYTISCUS*.

GENERIC CHARACTER.

Antennæ setaceous. *Palpi* six, filiform. *Mandibulæ* thick, arched, terminating in two or three teeth. Hind feet hairy, made for swimming.

General Observations.

This is an amphibious genus, inhabiting the water in the day-time, but in the evening crawling to land and taking flight. They swim with great agility, and nothing can be better calculated than their hind legs for the purpose. They are two feathered oars, of due proportions, presenting a resistance to the stream, which by a muscular effort of the insect impels the body forward with great celerity. Although capable of living a long while under water, the *Dytiscus* is occasionally obliged to come to the surface for air. And here we cannot but notice one of those simple, but effective, contrivances, by which the insect accomplishes its end without being conscious of the means. The body

being specifically lighter than the water, rises when the animal is perfectly at rest, but rises tail foremost. In this situation, with the tail above the water, but the head beneath, the *Dytiscus* raises the end of its wing-cases, a vacuum is formed, a bubble of air rushes under and forward, the head becomes buoyant, and the insect breathes. The return to the bottom is easily managed; the wing-cases are pressed against the body, the air is expelled, and the legs are put in motion.

The *Dytisci* are carnivorous, and are perpetually chasing other insects, which they seize with their fore-feet, and devour with voracity.

The larva is very singular in its appearance, more resembling a shrimp than any thing else. It has a strong pair of forceps, and such a disposition to use them, that the larger sort not only attack other water-insects, but are said to destroy the young fry of fish, which it seizes with violence, and presently overcomes. The chrysalis, which is found in the soft earth on the banks of the water, changes in about three weeks, and is succeeded by the perfect insect.

DYTISCUS.



D. cinereus.

SPECIFICATION.

DYTISCUS CINEREUS. Dy. elytrorum margine thoracisque medietate flavis. *Linn. Syst. Nat.* p. 666.
Gmel. p. 1946. *Fabr. Syst. Ent.* p. 231. *Spec.*
Ins. 1. p. 293. *Mant. Ins.* 1. p. 190.

Degeer, Ins. 4. p. 397. No. 4.

Roesel, Ins. 2. *Aquat. Class* 1. t. 3. f. 6.

Schaeff. Icon. Ins. t. 90. f. 7.

Inhabits Europe, and is very common in stagnant waters.

Pl. 24. a. A horn. b. A hind-leg. c. A fore-leg.

GENUS XXV. *CARABUS*.

GENERIC CHARACTER.

Antennæ filiform, about half as long as the body.

Palpi six. *Thorax* somewhat heart-shaped, with the apex truncated, and margined.

Elytra margined. *Tarsi* with five articulations.

General Observations.

This is a numerous genus, and most of the species are apterous. They have wing-cases, indeed, but when they are separated from the body, the rudiments only of the wings appear; that is to say, a little, thin, strait, membranous film, differing in length, but always too short for the purpose of flight. Such as have wings rarely make use of them.

The larvæ of the Carabi live in the ground, and in rotten wood. They are difficult to meet with, and consequently but little known. They have a long soft body, with six scaly feet, and a pair of strong jaws, with which they seize the larvæ of such insects as serve them for food.

Their voracity is exemplified by Reaumur, in his account of the larva of the *Carabus Syco-phanta*. That insect, with its scaly pincers, will attack a caterpillar by the belly, and burying its head in the body, notwithstanding the writhing of the sufferer, will persevere till the whole is devoured. The largest caterpillar is hardly sufficient for one day's nourishment; and it will eat several in the same day, when they are to be found. They are so gluttonous, that when they have an opportunity, they stuff themselves to such a degree, that the skin seems ready to crack with repletion. This inordinate appetite does not always go unpunished; for Reaumur says, that he has sometimes seen the largest of these worms, when from repletion they have been unable to move, attacked by the young and active of their own species, who in their turn have fattened on the bodies of their brethren. It seems these young barbarians were not driven to this act from necessity, since there were abundance of caterpillars to be had at the time.

The Carabi are very active insects, and are

frequently met with in fields and gardens running with great quickness, and hiding themselves in the ground, and under stones. They for the most part shun the light, and seek their food in the evening, preying with great voracity on other insects; and (as if they still retained the impression of their former barbarous habits) often on each other. They have a very strong and disagreeable smell; and, when taken, exude from the mouth and anus, a drop of a nasty, acrid, and very caustic liquor.

SPECIFICATION.

CARABUS CLATHRATUS. C. apterus nigricans, elytris porcatis: interjectis punctis excavatis longitudinalibus. *Linn. Syst. Nat.* p. 669. *Gmel.* p. 1962. *Fabr. Syst. Ent.* 1. p. 238. *Spec. Ins.* 1. p. 302. *Mant. Ins.* 1. p. 197.

Degeer, Ins. 4. p. 87. t. 3. f. 12.

Voet. Coleopt. 2. t. 38. f. 40.

Panzer, Faun. Ins. Germ. fasc. 75. t. 1.

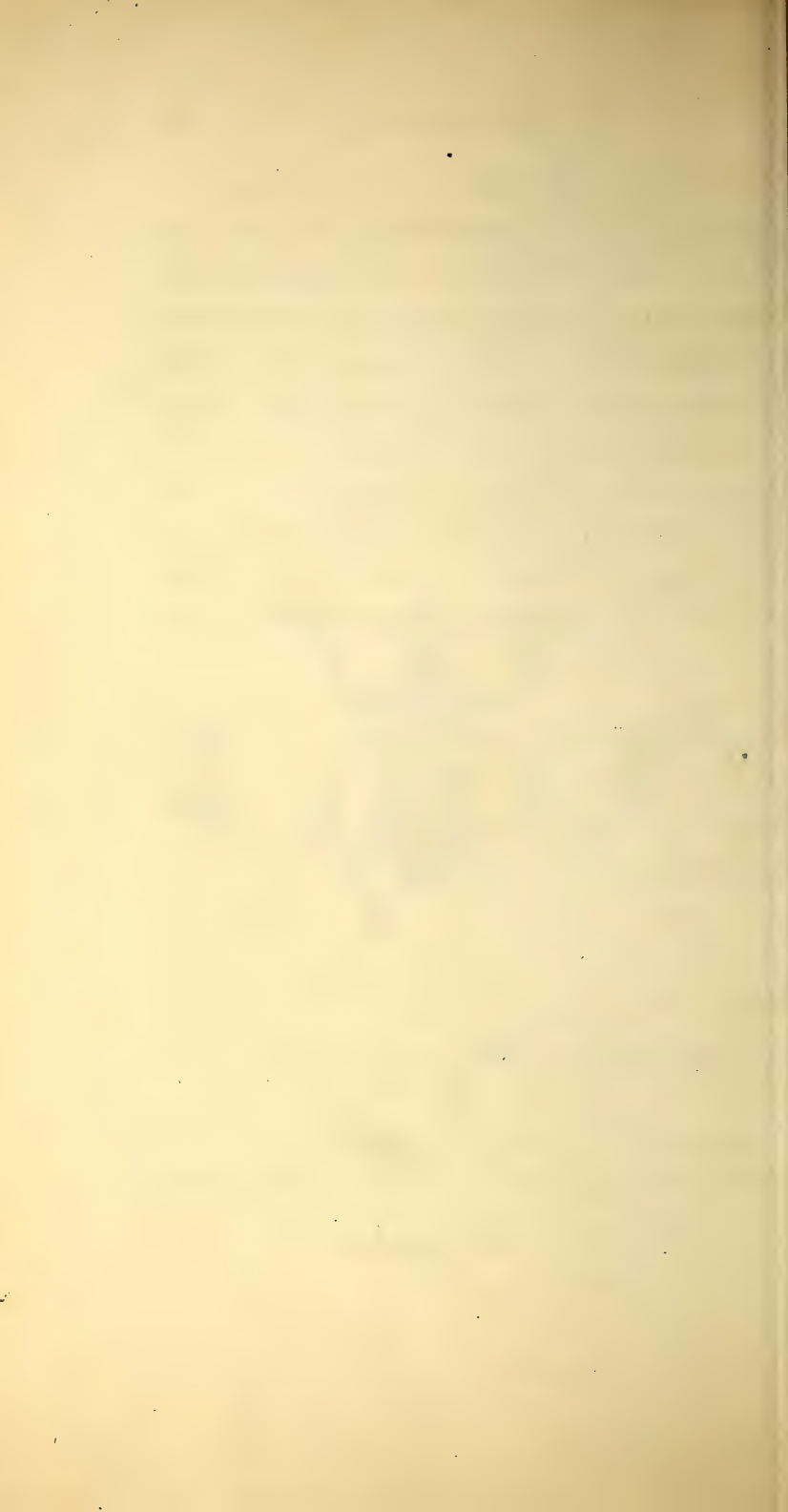
Inhabits Europe, and is found, though not common, in woods.

Pl. 25. a. A horn. b. A feeler. c. The thorax. d. A leg.

CARABUS.



C. clatibratus.



GENUS XXVI. *TENEBRIO*.

GENERIC CHARACTER.

Antennæ moniliform, with the last joint rounded.

Thorax plano-convex, and margined. *Head* projecting. *Elytra* rather stiff. *Tarsi* with four articulations, the third heart-shaped.

General Observations.

This genus is divided by Linnæus into two sections: in the first, the insects want wings, and the wing-cases are united, forming but one piece. In the second, the wings are perfect and the cases divided.

The Tenebriones are smooth, dark-coloured insects, and for the most part emit a very disagreeable smell; for which reason they have been called *stinking beetles*. They run quickly, and fly well; but prefer the evening or the night for their excursions. They are found in houses, particularly in granaries; they are also met with in gardens and sandy places.

The larvæ are of a yellowish white colour, with a body formed of twelve scaly rings, and

an oval flattish head furnished with mandibles, antennæ, and feelers. Six scaly legs proceed from the first three rings. When the larva is in motion, a fleshy mass proceeds from the tail, which the insect uses as an additional foot. These larvæ feed on flour, bread, sugar, and even dead and rotten wood. The *meal-worm*, which is the larva of the *Tenebrio molitor*, and is so frequently found in bake-houses, is about an inch long, with a slender polished body. It is said to be a favourite food of the nightingale.

SPECIFICATION.

TENEBRIO LÆVIGATUS. T. apterus niger lævis, elytris lævibus, thorace lunato subtus cæruleus. *Linn. Syst. Nat.* p. 678. *Gmel.* 1. p. 1997. *Fabr. Ent. Syst.* 1. p. 111. *Spec. Ins.* 1. p. 323. *Mant. Ins.* 1. p. 211.

Panzer, Ent. Germ. pl. 8.

Inhabits Africa.

Pl. 26. a. The head and antennæ magnified. b. *Palpi*.
c. The thorax. d. A leg.

TENEBRIO.



T. lavigatus.

GENUS XXVII. *MELOE*.

GENERIC CHARACTER.

Antennæ moniliform, with the last articulation oblong. *Palpi* four, unequal. *Thorax* roundish. *Elytra* soft and flexible. *Head* inflected and gibbous.

General Observations.

The insects of this genus are frequently found in the spring, in the fields and cultivated grounds. They feed on the leaves of plants, and when taken up, exude a little drop of a yellow viscous liquor from the articulation of each leg. In the month of May the females increase prodigiously; the abdomen becomes so distended, as in some degree to impede their motion; and towards the end of the month they are relieved, by depositing their orange-coloured eggs in the ground.

The larvæ are very small, and of a yellow colour, with black eyes. They live, says Dr. Shaw, by attaching themselves to other insects, and absorbing their juices. Degeer having put

some flies in a box with these larvæ, observed that they collected in great numbers under the thorax of the fly, so that in a short time they sucked it to death.

The celebrated Blister fly is classed by Linnæus in this genus.

SPECIFICATION.

MELOE BIMACULATUS. *M. alatus niger*, elytris luteis macula nigra postica. *Linn. Syst. Nat.* p. 680. *Gmel.* p. 1738.

Apalus bimaculatus. *Fabr. Syst. Ent.* 1. p. 127. *Spec. Ins.* 1. p. 161. *Ent. Syst.* 1. p. 50.

Degeer, Ins. 5. t. 1. f. 18.

Panzer, Faun. Ins. Germ. fasc. 104. t. 4.

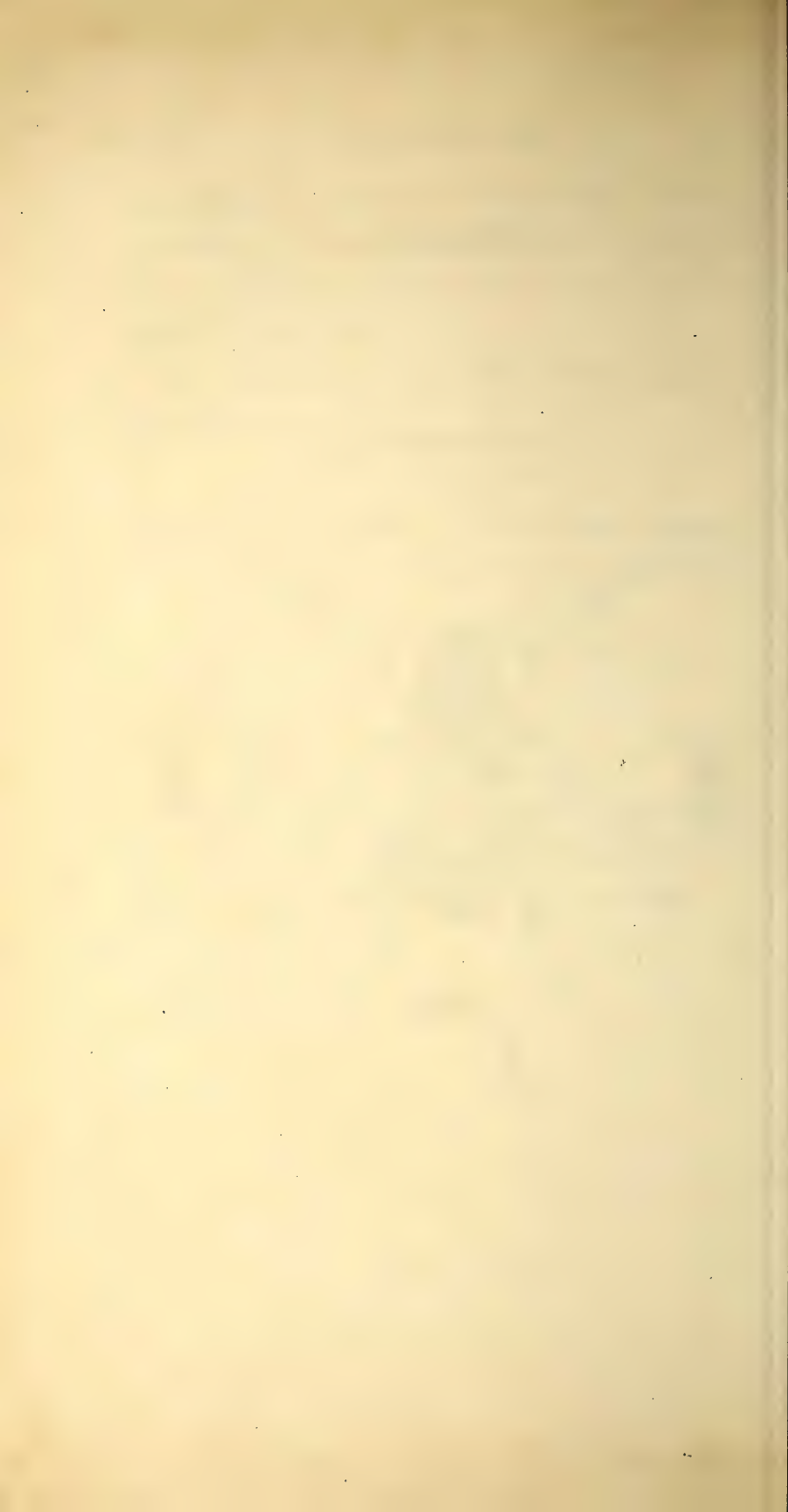
Inhabits Europe, and frequents sandy places.

Pl. 27. a. The natural size. b. Magnified. c. A horn. d. Lips with two of the palpi. e. A leg.

MELOE.



M. bimaculatus.



MORDELLA.



M. frontalis.

GENUS XXVIII. MORDELLA.

GENERIC CHARACTER.

Antennæ filiform, sometimes serrated, sometimes pectinated. *Palpi* four; the anterior ones the longest and clavated; the posterior filiform. *Thorax* convex. *Head* bent down when disturbed. *Elytra* curved downwards towards the tip. A broad lamina at the base of the abdomen, before the thighs. *Abdomen*, in the females, pointed.

General Observations.

Very little is known of the habits of this genus of insects. They are few in number, small in size, and are generally found on flowers. The larva of the Mordellæ has not been described.

SPECIFICATION.

MORDELLA FRONTALIS. *M. atra*, fronte pedibusque flavescens. *Linn. Syst. Nat.* p. 682. *Gmel.* p. 2024. *Fabr. Spec. Ins.* 1. p. 333. *Mant. Ins.* 1. p. 219. *Ent. Syst.* 1. pt. 2. p. 114.

Panzer, Faun. Ins. Germ. fasc. 13. t. 13.

Inhabits Europe, and is found on flowers.

Pl. 28. a. Natural size. b. Magnified. c. The head.
d. The anterior palpi. e. Antennæ. f. A leg.

GENUS XXIX. STAPHYLINUS.

GENERIC CHARACTER.

Antennæ moniliform. *Palpi* four. *Elytra* half the length of the abdomen, and covering the wings. *Tail* simple, with two oblong vesicles, which the insect can protrude or contract at pleasure. *Tarsi* with five articulations in each foot.

General Observations.

This genus, which bears some resemblance to the following, may be easily distinguished by the want of pincers at the end of the abdomen, with which the earwig is always provided. The Staphylini have a long body and short wing-cases, which in some species are so small, that without particular attention they may be overlooked. They are very voracious, devouring without mercy every weaker insect, not excepting their own species. When irritated they erect their tail in a menacing manner, and protrude from it the two vesicles mention-

ed in the generic character, which are doubtless intended for weapons of defence.

Their larvæ so greatly resemble the perfect insect, that it is difficult to distinguish one from the other. They live in moist places under ground.

SPECIFICATION.

STAPHYLINUS ERYTHROPTERUS. *S. ater*, elytris pedibusque rufis. *Linn. Syst. Nat.* 1. p. 683. *Gmel.* 1. p. 2027. *Fabr. Spec. Ins.* 1. p. 335. *Mant. Ins.* 1. p. 220.

Schaeff. Elem. t. 117.

——— *Icon. t.* 2. *f.* 2.

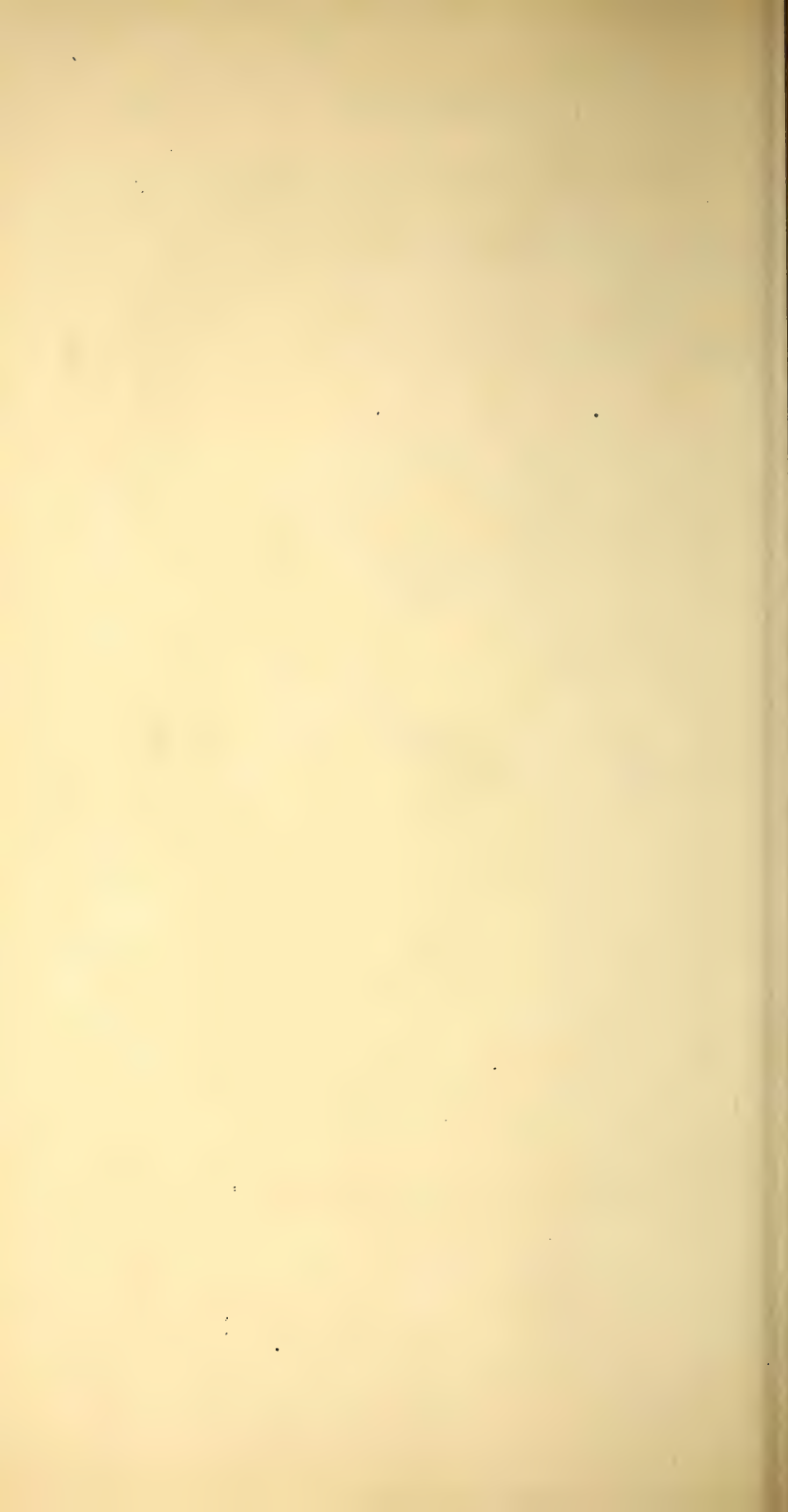
Inhabits Europe, and is found in dung.

Pl. 29. a. The head magnified. b. Antennæ. c. Palpi. d. The thorax. e. A leg.

STAPHYLINUS.



S. erythropterus.



GENUS XXX. *FORFICULA*.

GENERIC CHARACTER.

Antennæ setaceous. *Palpi* four, unequal, and filiform. *Elytra* very short and covering the folded wings. *Abdomen* terminating in a kind of forceps. *Tarsi* with three articulations.

General Observations.

The insects of this genus are found in the ground and in moist places ; under stones, and under the bark of old half-decayed trees. They feed on different substances, but are particularly fond of fruits. Degeer observes, that about the beginning of April, the females may be found under stones with a collection of eggs, which they watch with the greatest care, never going far from their charge ; and if they should be scattered abroad, collecting them again one by one, till they are all restored to the same place. Previous to laying the eggs, their body is greatly inflated, and the beating of the heart, or principal artery which runs along the back, may be plainly distinguished through the transparent skin. The young insects resemble the

mother, except that they have neither wings nor wing-cases. The earwig, that well-known species of the genus *Forficula*, has been unjustly accused of causing death by penetrating the brain through the ear. This is a vulgar error:—the insect may lodge in the external ear while a person sleeps on the ground, but it has no power to penetrate further. This accident may have given rise to the tale; for it is the habit of the earwig to hide itself wherever it can, and it is no uncommon thing to place the bowl of a tobacco-pipe on an upright stick in gardens as a trap, into which they collect in numbers.

SPECIFICATION.

FORFICULA AURICULARIA. F. elytris apice albis.

Linn. Syst. Nat. 1. p. 686. *Gmel.* 1. p. 2038. *Fabr.*

Syst. Ent. p. 269. *Spec. Ins.* 1. p. 340. *Mant. Ins.*

1. p. 224.

Schaeff. Elem. t. 63.

—— *Icon. t.* 144. *f.* 3, 4.

Inhabits Europe, and is found under the bark of trees, under stones, and in gardens.

Pl. 30. a. The body with the wings expanded. b. A horn. c. A leg.

FORFICULA.



F. auricularia.



ORDER II.

HEMIPTERA.

THE word Hemiptera, which signifies half wings, is expressive of the semi-coriaceous, or parchment-like state of the Elytra in the insects of this Order. In the Coleoptera, the elytra are separated from each other by a suture, and are perfectly coriaceous. In the Order Hemiptera, the wing-cases do not meet together in the same manner, but have their inferior margins crossed, or laid one over the other, and the upper half is often of a horny nature, while the lower half is a perfectly transparent membrane. In this respect, there is a considerable deviation, *i. e.* in the proportion of the coriaceous matter which partly composes the upper wings. In some it is considerable, while in

others, especially in the genus *Cicada*, it is so small as to form, as it were, the connecting link between insects with semi-coriaceous elytra, and those with their four wings entirely naked. If it be absolutely necessary that the classific character should be uniform, and constant in all the genera, we ought rather to depend on the form of the mouth, which is a species of rostrum, or beak, bent inwards along the breast, and is a character which is not only easily perceived, but belongs exclusively to the insects of this Order.

GENUS XXXI. *BLATTA*.

GENERIC CHARACTER.

Antennæ setaceous. *Palpi* unequal, filiform. *Head* inflated; hidden under the anterior part of the thorax. *Thorax* flattish, orbicular, and margined. *Elytra* and wings extended, smooth, semi-coriaceous. *Abdomen* terminated, in both sexes, by two moveable appendices, like horns. *Feet* formed for running.

General Observations.

The *Blattæ* are very active insects. They run very fast, and generally use their legs rather than their wings, though some of the species can fly very well. They for the most part avoid the light, and leave their lurking places only in the night, from which circumstance they were named by former Naturalists, *lucifugæ*. That pest of our kitchens and bakehouses, commonly called the *black beetle*, is a species of this genus, for which we were originally indebted to South America; and which, it seems, was

brought to us by the way of the East Indies, from whence is derived its trivial name of *orientalis*. It is fortunate for us, that the largest of the genus, the *B. gigantea*, cannot be naturalized, since the ravages it commits are such, as to make it hardly bearable in a house. In tropical countries, particularly in South America, these insects commit the greatest depredations: nothing comes amiss to them: they get at every thing, and what they cannot eat they spoil with their excrement. Drury describes them as being very fond of ink, into which they are apt to fall, and soon become so offensively putrid, that a man might as well sit over the cadaverous body of a large animal, as write with the ink in which they have died. They fly into the faces and bosoms of persons, exciting by their spiny legs a sudden horror not easily described. They make a noise in the night like a smart knocking with the knuckle on the wainscot; so that three or four of them will make such a drumming, as to disturb the rest of those who are not very good sleepers. Drury adds, that the sick and dying have their extremities at-

BLATTA.



B. orientalis

tacked by them, and that the ends of the toes and fingers of the dead, are frequently stripped of the skin and flesh.

SPECIFICATION.

BLATTA ORIENTALIS. B. ferrugineo-fusca; elytris abbreviatis: sulco oblongo impresso. *Linn. Syst. Nat.* p. 688. *Gmel.* 1. p. 2043. *Fabr. Ent. Syst.* 2. p. 9. *Spec. Ins.* 1. p. 343. *Mant. Ins.* 1. p. 226.

Degeer, Ins. 3. p. 530. t. 25. f. 1, 2.

Schaeff. Icon. t. 155. f. 6, 7.

Panzer, Faun. Ins. Germ. fasc. 96. t. 12.

Inhabits America, Asia, and Europe. Frequents houses, and is known by the name of black beetle.

Pl. 31.

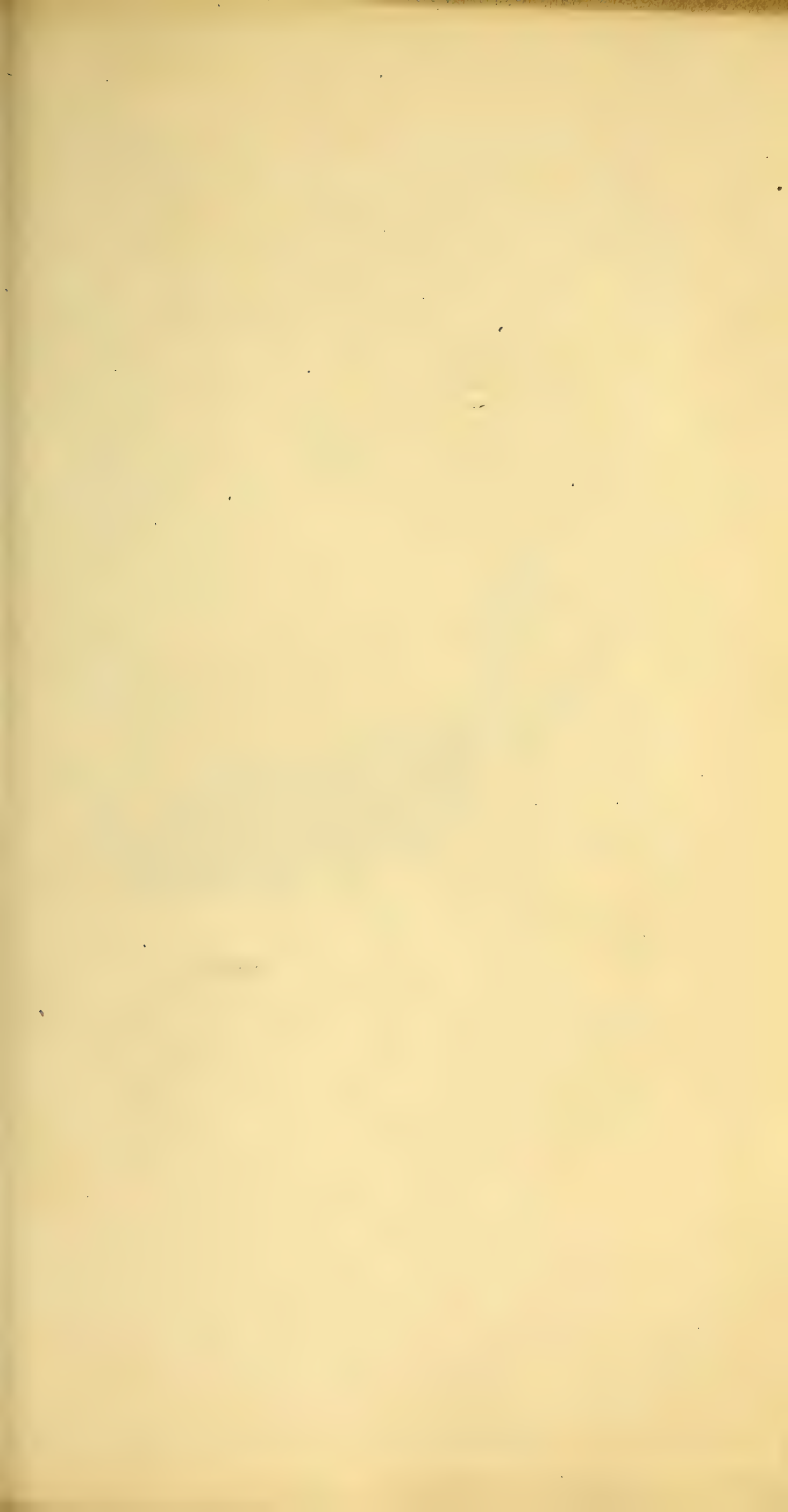
GENUS XXXII. MANTIS.

GENERIC CHARACTER.

Antennæ setaceous. *Head* unsteady, armed with strong jaws, and furnished with Palpi. *Thorax* linear. *Wings* four, membranous, and wrapped round the body; the under ones folded. *Fore feet* compressed, serrated beneath, and terminated by a single nail or claw, and a setaceous, jointed foot. *Hind legs* smooth, and formed for walking.

General Observations.

This is a remarkable genus of insects, containing some species of the most singular figure imaginable. In one we meet with the exact resemblance of a dried leaf. In another, the limbs are, as it were, scattered about, and resemble the conjunction of so many withered stalks; while a third looks like a long dried stick, with six lateral branches. These are all remarkable only for their appearance, but there is one, the *Mantis religiosa*, whose peculiarity of manner has attracted universal notice. This



MANTIS.

*M. religiosa.*

insect is generally seen in a sitting posture, with the two fore-legs raised and closed together, which gives it such a praying attitude, that the Eastern devotees will not suffer it to be disturbed. The Turks are said to believe that they stand with their heads towards Mecca, and move their hands in prayer to Mahomet.

These insects are so quarrelsome, and have such a disposition to destroy each other, that the Chinese keep them in bamboo cages, and make them fight for their amusement. In the event of a battle, the conqueror, without scruple, devours his antagonist.

The female lays a considerable number of long yellow eggs, which she generally fixes to the stem of some plant, and covers them with a glutinous secretion, which in drying forms a tough coriaceous nidus.

SPECIFICATION.

MANTIS RELIGIOSA. M. thorace lævi subcarinato, elytris viridibus immaculatis. *Linn. Syst. Nat.* 1. p. 690. *Gmel.* 1. p. 2050. *Fabr. Spec. Ins.* 1. p. 348. *Ent. Syst.* 2. p. 20. No. 30 β .

Roesel. Ins. 2. Gryll. t. 1. f. 2. t. 2. f. 6.

Schaeff. Elem. t. 81.

Panzer, Faun. Ins. Germ. fasc. 50. t. 8.

Inhabits the East, and is found also in the South of France and in Germany.

Pl. 32. a. A fore-leg, with its claw and little foot.

GENUS XXXIII. *GRYLLUS*.

GENERIC CHARACTER.

Antennæ setaceous in some, in others filiform.

Palpi four, filiform. *Head* inflected. *Maxilla* horny, thin, pointed, with a long and sharp interior tooth. *Wings* four, deflexed, and convoluted; under ones concealed beneath the elytra. *Hind feet* formed for leaping. *Tarsi* with three articulations terminated by two nails or crotchets.

General Observations.

Linnæus has divided the Grylli into the following sections:—

1. *Acridæ*. Having a conical head longer than the thorax. *Antennæ* ensiform, or sword-shaped.
2. *Bullæ*. Having the thorax carinated or keeled, with the *Antennæ* shorter than the thorax, and filiform.
3. *Achetæ*. Having two setæ or bristles in the tail.

4. *Tettigoniæ*. The female having a sheath or tube projecting from the tail. Antennæ setaceous.
5. *Locustæ*. Having the tail simple, without bristles or tube, with the Antennæ filiform.

With the exception of those of the first section, which prey on other insects, all the Grylli are herbivorous. The Achetæ feeding chiefly on roots, and the Tettigoniæ and Locustæ, on leaves.

It is no longer a doubt that the sharp chirping made by the grasshopper and cricket is effected by friction. When the Gryllus is inclined to make a noise, it raises its elytra, or wing-cases, till they form a sharp angle with the body, and then rubs them forcibly together with a rapid motion that produces the sound. The insect makes this noise only when in perfect security. As you approach a grasshopper, the sound diminishes, and ceases entirely when you are too near.

The most singular insect of this genus, and

GRYLLUS.



G. Gryllotalpa.

at the same time the most disagreeable in appearance, is the mole cricket, which burrows under ground like a mole, raising a furrow as it proceeds. It is at once distinguished from all others, by the apt formation of its fore-feet, which are divided into several segments, or claws, spreading out like the palm of the hand, by means of which the insect is enabled to perform its instinctive functions in the most effective manner. It moves slowly, and never leaves its hiding-place till the close of the day. The female lays between two and three hundred eggs in an oval nest under ground, and is very careful of her charge till they are hatched,

SPECIFICATION.

GRYLLUS GRYLLOTALPA. Gr. thorace rotundato, alis caudatis elytro longioribus, pedibus anticis palmatis tomentosis. *Linn. Syst. Nat.* 1. p. 693. *Gmel.* 1. p. 2059.

Acheta Gryllo-talpa. *Fabr. Syst. Ent.* p. 279. *Spec. Ins.* 1. p. 353. *Mant. Ins.* 1. p. 231. *Ent. Syst.* 2. p. 28.

Roesel. Ins. 2. *Gryll. t.* 14, 15.

Schaeff. Icon. Ins. t. 37. f. 1.

Inhabits Europe, and frequents the sides of ponds and streams. Is commonly known by the name of mole cricket; feeds on vegetables, and often destroys young cabbages, &c.

Pl. 33.

GENUS XXXIV. *FULGORA*.

GENERIC CHARACTER.

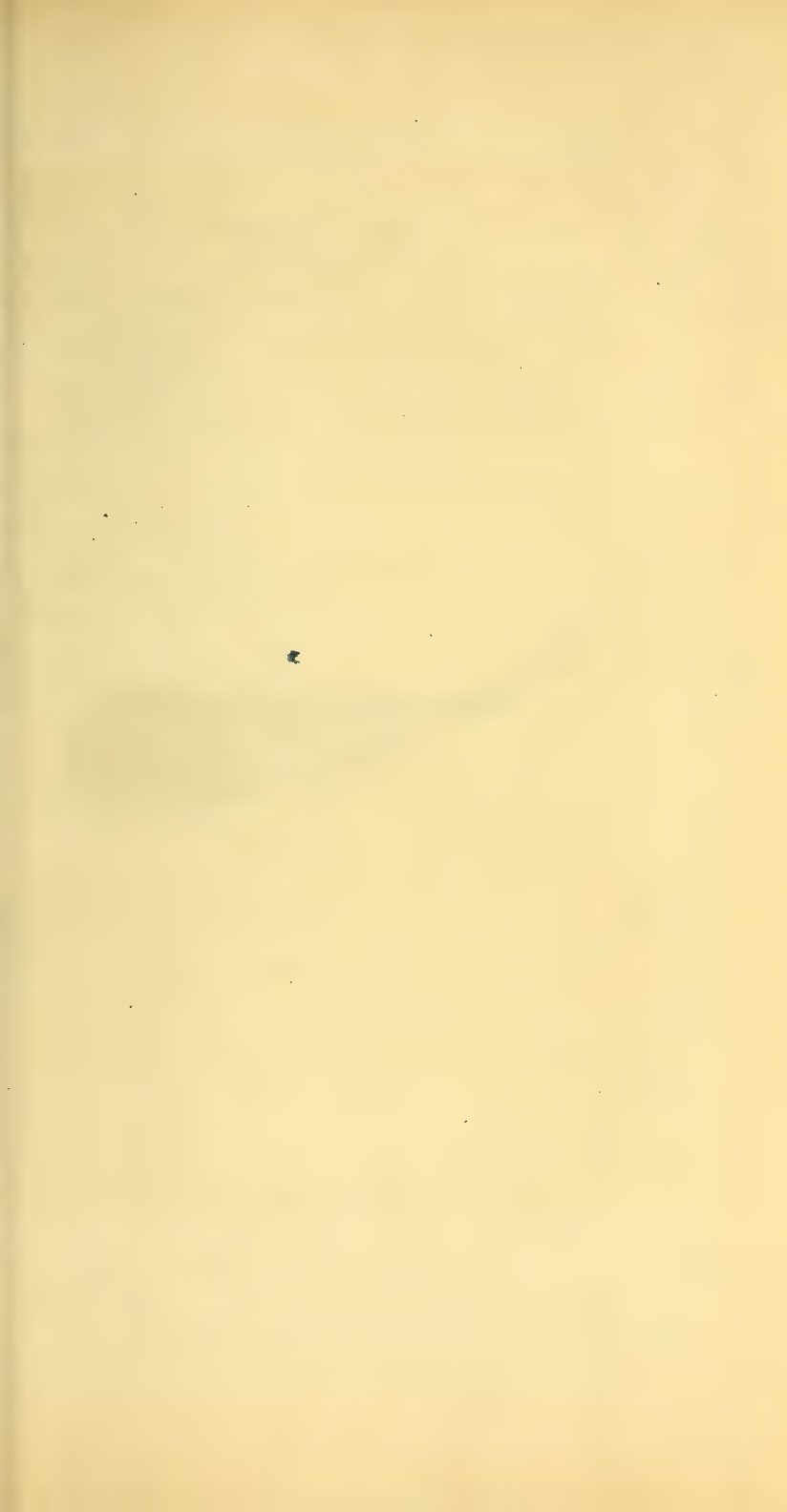
Antennæ short, seated below the eyes, with two articulations ; the exterior the largest, and globose. *Head* produced, extended and empty. *Rostrum* inflected, elongated, articulated, channelled, and containing three unequal bristles. *Feet* formed for walking. *Tarsi* with three articulations.

General Observations.

Among the various ways in which it has pleased Nature to diversify the different subjects of her extensive kingdom, there is no example more peculiar, or better adapted to answer the end designed, than that of the *Fulgora*. In the largest species of the genus (the *F. Lanternaria*) is seen a bladder, like a head, of very considerable dimensions compared with the body, and of an elongated shape. It is perfectly transparent, and is, in fact, similar to a horn lantern. Within this cavity a natural operation, imitated by chemistry, is going on ;

phosphorus is formed, and in the night so strong a light emitted, that by the help of a single insect a common newspaper may be read. The largest and finest of the Fulgoræ are found in South America, in Cayenne, or in Surinam.

There is also a species found in China, the *F. Candelaria*, figured in Pl. 34, which is remarkable for the neatness of its shape and the pretty marking of its wings. This, like the others, has a projecting snout, which gives a lively shining light in the night time, equal in proportion to its size, to the larger species of South America. It has not hitherto been observed that those found in Europe possess the shining quality, though one might naturally suppose, that the same faculty pervaded the whole genus. These smaller European species frequent shrubs and bushes, and are very easily taken; but those inhabiting the hotter climates fly with agility, and living on the tops of large trees, are very difficult to catch. The larvæ are unknown.



FULGORA.



F. Candelaria.

SPECIFICATION.

FULGORA CANDELARIA. F. fronte rostrata subulata adscendente elytris viridibus luteo maculatis, alis flavis apice nigris. *Linn. Syst. Nat.* 1. p. 703. *Gmel.* 1. p. 2089. *Fabr. Spec. Ins.* 2. p. 213. *Mant. Ins.* 2. p. 260. *Ent. Syst.* 4. p. 2.

Roesel. Ins. 2. *Gryll.* t. 30.

Sulz. Ins. t. 10. f. 62.

Inhabits China, where it is very common.

Pl. 34.

GENUS XXXV. *CICADA*.

GENERIC CHARACTER.

Antennæ setaceous, shorter than the head. *Rostrum* bent inwards under the breast, channelled in its upper part, and containing a sucker formed of three thin bristles. *Wings* four, membranous, and declining along the sides of the body. *Feet*, in the majority, made for leaping.

General Observations.

Linnæus has divided the *Cicadæ* into the following sections :

1. *Foliaceæ*. Thorax compressed, membranous, and larger than the body.
2. *Cruciataæ*. Thorax with a horn or spine, on each side.
3. *Maniferaæ*. Feet not made for leaping.
4. *Ranatraæ*. The hind feet made for leaping.
5. *Deflexæ*. Wings deflected, or wrapped round the sides of the body.

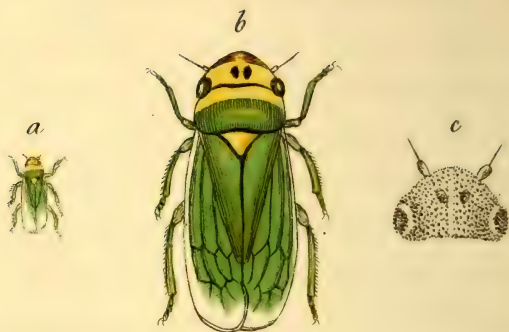
It is in the months of June and July in the

warmer climates, that the Cicadæ are heard to make the chirping noise, which has gained them the notice of Virgil, and the praise of Anacreon. This noise is sharp, monotonous, and tiresome from its constant repetition. It is said, that a single Cicada hung up in a cage is almost sufficient to drown the voice of a whole company. They are generally found on the trunk or in the branches of trees, and rarely change their place. They, however, can fly with great strength and rapidity, and are very active in the middle of the day; but the slightest cold benumbs them: consequently the best time to take them is early in the morning, or after sunset. What has chiefly excited the attention of Naturalists in the history of the Cicada, is the piercing sound which proceeds from its little body. For the investigation of the cause by which the sound is produced, we are indebted to the labours of Reaumur and Roesel, who have unfolded the curious apparatus which enables the Cicada to effect its purpose. "It proceeds from a pair of concave membranes, seated on each side the first joints of the abdo-

men. The large concavities of the abdomen, immediately under the two broad lamellæ in the male insect, are also faced by a thin, pellucid, iridescent membrane, serving to increase and reverberate the sound; and a strong muscular apparatus is exerted for the purpose of moving the necessary organs." It is the male alone that makes the noise, the female is perfectly mute. She has a borer or trunk, projecting from the end of the abdomen, with which she pierces the dead and half-decayed branches of trees, and deposits in the hole her white, oblong, pointed eggs. She makes many holes a quarter of an inch deep, and deposits in each eight or ten eggs, placing them in such a manner, that the posterior end of one may be opposite the anterior end of the following.

That froth, adhering to the leaves and stems of plants, which is so well known to every one by the name of Cuckow-spittle, contains the larva of the *Cicada spumaria*, which, in due time, leaves its watery mansion, and skips about the fields in its perfect state. It is then the children's Froghopper.

CICADA.



C. viridis.

SPECIFICATION.

CICADA VIRIDIS. C. elytris viridibus, capite flavo;
punctis nigris. *Linn. Syst. Nat.* 1. p. 711. *Gmel.* 1.
p. 2114. *Fabr. Spec. Ins.* 2. p. 326. *Mant. Ins.* 2.
p. 271. *Ent. Syst.* 4. p. 37.

Panzer, Faun. Ins. Germ. fasc. 32. t. 9.

Inhabits Europe, and is found on flowers and on different plants.

Pl. 35. a. Natural size. b. Magnified. c. The head.

GENUS XXXVI. NOTONECTA.

GENERIC CHARACTER.

Antennæ shorter than the thorax. *Rostrum* inflected. *Wings* four, coriaceous from the base to the middle, crossed over each other. *Hind feet* edged with hairs, and formed for swimming.

General Observations.

The Notonectæ are aquatic insects, inhabiting standing waters and sluggish rivers. They swim on their back, and generally in an inclined position. Unless disturbed they remain upon the surface of the water; but on the approach of danger, they immediately disappear, though they cannot remain any great length of time without coming to the top to breathe. They frequently creep on the water plants and the mud, in search of the smaller insects on which they feed. In the fine warm nights they often land and fly about, sometimes to a considerable distance.

The female lays a great number of white,

NOTONECTA.



N. glauca.

elongated eggs, which she generally places on the stems and leaves of aquatic plants. In the beginning of spring the little ones break their shell, and directly swim upon their back as well as their mother. The larvæ resemble the perfect insect, except in the want of wings. They have the same habits, living in the same manner, and waging continual war with the lesser insects. In about two months they take upon them the chrysalis state, and in a short time after, undergo their last change, and appear with their wings and semi-coriaceous wing-cases.

SPECIFICATION.

NOTONECTA GLAUCA. N. elytris griseis, margine fusco punctato apice bifidis. *Linn. Syst. Nat.* 1. p. 712. *Gmel.* 1. p. 2118. *Fabr. Spec. Ins.* 2. p. 331. *Mant. Ins.* 1. p. 275.

Roesel. Ins. 3. *App. t.* 17.

Schaeff. Icon. Ins. t. 33. *f.* 5, 6.

Panzer, Faun. Ins. Germ. fusc. 3. *t.* 20.

Inhabits Europe, and is common in standing waters.

Pl. 36. a. The head magnified. b. A horn. c. A leg.

GENUS XXXVII. *NEPA*.

GENERIC CHARACTER.

Antennæ very short, triarticulate, and hid under the eyes. *Rostrum* inflected; sheath containing three bristles. *Wings* four, folded together crosswise; the anterior part coriaceous. Two fore-feet cheliform (crab-like), the four others formed for walking.

General Observations.

The *Nepæ*, like the *Notonectæ*, inhabit ditches, canals, marshes, lakes, and other standing waters. They swim but slowly, and spend most of their time at the bottom of the water, seeking on the mud for the different insects which serve them for food, and which they seize very forcibly with their crab-like feet. In the night they leave the ponds, and fly about with great agility.

The larvæ, which are found in the same places, differ from the perfect insect only in

NEPA.



N. linearis.

the want of wings. Their habits are the same, and their appetite for other insects equally voracious. The larva of the common Water Scorpion (*Nepa cinerea*) proceeds from an egg of a very singular form. It is oval, and from one end proceed seven delicate filaments, which give it the appearance of some of the seeds of plants belonging to the class Syngenesia. Swammerdam, who has described and figured these eggs, speaks of their arrangement in the ovaria, which are five in number, on each side the abdomen of the female. He says they are so disposed, that the filament of that nearest the orifice, embraces the egg which is to follow, which again is entangled with the one behind, and so on to the last. The eggs of the *Nepa linearis* differ from the above, in having but two filaments at the end.

SPECIFICATION.

NEPA LINEARIS. *N. linearis*, manibus spina laterali pollicatis. *Linn. Syst. Nat.* 1. p. 714. *Gmel.* 1. p. 2122. *Fabr. Syst. Ent.* p. 692. *Spec. Ins.* 2. p. 334. *Mant. Ins.* 2. p. 277.

Degeer, Ins. 3. p. 396. t. 19 f. 1, 2.

Roesel. Ins. 3. App. 1. t. 23.

Schaeff. Icon. Ins. t. 5. f. 5, 6.

Inhabits Europe, and is found in stagnant waters.

Pl. 37.

GENUS XXXVIII. *CIMEX*.

GENERIC CHARACTER.

Antennæ longer than the thorax. *Rostrum* inflected. *Wings* four, folded together crosswise; the upper ones coriaceous from their base towards the middle. *Back* flat. *Thorax* margined. *Feet* formed for running.

General Observations.

The Linnæan divisions of this genus are as follows :—

1. *Apteri*. Without wings.
2. *Scutellati*. With the escutcheon as long as the abdomen.
3. *Coleoptrati*. With the elytra almost wholly coriaceous.
4. *Membranacei*. Much depressed, like a leaf.
5. *Spinosi*. In which the thorax has a spine on each side.
6. *Rotundati*. Of an oval shape.

7. *Seticornes*. With the antennæ setaceous towards the point.
8. *Oblongi*. Of an oblong shape.
9. Having the antennæ wholly setaceous.
10. *Spinipedes*. Having thin thighs armed with spines.
11. *Lineares*. With a narrow elongated body.

Among this numerous tribe of insects, there is one, which is unhappily but too well known, and too generally felt, to be disregarded. The bed-bug, *Cimex lectularius*, we have every reason to believe, has been a domestic pest from time immemorial; at least it is mentioned by some of the Greek writers, who spoke of the animal with feelings wholly independent of a taste for Natural History. Southall, a celebrated bug-catcher, who published a treatise on the subject in the year 1730, says that the bug was scarcely known in England before the year 1670, when it was imported among the timber used in rebuilding the City of London

CIMEX.



C. bicolor.

after the great fire in 1666; but we have the authority of Mouffet to prove, that this troublesome insect was known in this country long before the fire. In the beginning of summer, says Dr. Shaw, it deposits its eggs, which are very small, white, and of an oval shape, each standing on a kind of short pedicle or foot-stalk, in the cavities of walls or wood-work. The young, which are hatched in a few weeks, arrive at their full size in about three months. In their winter retreats they can bear the most intense frost without injury; and are always ready, as soon as the warm weather returns, to take the field.

Most of the species, when touched, have a very strong and disagreeable smell. They are met with in woods and shady places, &c., and many of them are very prettily marked.

SPECIFICATION.

CIMEX BICOLOR. *C. ovatus* elytris nigro alboque variis. *Linn. Syst. Nat.* p. 722. *Gmel.* p. 2156. *Fabr. Syst. Ent.* p. 715. *Spec. Ins.* 2. p. 358. *Mant Ins.* 2. p. 296. *Ent. Syst.* 4. p. 121.

Wolff, Cimic. t. 7. f. 60.

Schaeff. Icon. Ins. t. 41. f. 8, 9.

Panzer, Faun. Ins. Germ. fasc. 32. t. 11.

Inhabits Europe, in gardens and pastures.

Pl. 38. a. The natural size. b. The same magnified.

GENUS XXXIX. *APHIS*.

GENERIC CHARACTER.

Antennæ setaceous, longer than the thorax.

Rostrum inflected. *Wings* four, erect, or none at all. *Abdomen* with two little horns or spines on the hinder part. *Feet* formed for walking.

General Observations.

The following account of the Aphides is extracted from Stuart's Elements of Natural History. "The insects of this genus are small and defenceless, but very noxious animals, and most remarkable for the singularities in their history and manners. There are many species of the genus, which, for the most part, inhabit particular plants, attaching themselves generally to the young twigs, to the footstalks or leaves, and exhausting the juices; by which means these parts, particularly the leaves, are deformed and destroyed. They exude, partly from the horns on their abdomen, and partly from two orifices at the same place, a sweetish

juice which attracts ants and other inimical insects. There are often in the same species, and even in the same family, individuals with wings and without wings; and that without any respect to the difference of sex. But the males are in general much smaller than the females, and also less numerous. They seldom appear before autumn, when they impregnate their females, who soon after lay eggs, or rather a sort of capsules, in which the young *Aphides* lie, already perfectly formed, but do not break their shell till the following spring. When they appear it is very remarkable that they are almost wholly females, with hardly a male to be seen during the whole spring and summer. Notwithstanding this, all these female *Aphides* without any communication with a male are able to propagate their species; and seem to have received the genial influence, not merely for themselves alone, but for their posterity to the ninth generation. During the whole summer they are viviparous, and if a young *Aphis* is taken, immediately upon exclusion from the mother, and kept apart, it will produce young;

which young, if also kept apart, will likewise produce, and so on, without the presence of a male. Towards autumn, however, this singular fructification begins to lose its wonderful effects. The Aphides cease to bring forth females only; males likewise are produced, who immediately celebrate that nuptial rite which is to communicate fertility to the whole female posterity of the following summer. These facts are unquestionable; and the experiments are easily made. Let a person, in summer, take the leaf of a cabbage, which is infected with these minute insects, and he will find on the under surface a number of them together, covered with a sort of powder or whitish down. Upon carefully observing one of the largest, he will not fail, in a short time, to detect it in the act of parturition, when the young may be separated and kept apart on fresh cabbage leaves.—Most plants have their peculiar Aphides, but some are found on several plants. The species are with difficulty distinguished, and with still more difficulty defined. Linnæus has described but

few, and has contented himself with mentioning the plants on which they are to be found."

To this account we shall only add, that according to Reaumur each *Aphis* may produce about ninety young; and that, consequently, in five generations, the descendants from a single insect would amount to five thousand nine hundred and four million, nine hundred thousand.

SPECIFICATION.

APHIS ROSÆ. *A. Rosæ.* *Linn. Syst. Nat.* 1. p. 734.

Gmel. 1. p. 2204. *Fabr. Syst. Ent.* p. 737. *Spec.*

Ins. 2. p. 387.

Degeer, Ins. 3. p. 65. t. 3. f. 10.

Reaumur, Ins. 3. t. 21. f. 1—4.

Inhabits the stems of the rose.

Pl. 39. a. Natural size. b. The same magnified.

c. Aphides on the rose.

APHIS.



A. Rosa.

GENUS XL. *CHERMES*.

GENERIC CHARACTER.

Antennæ setaceous, longer than the thorax.

Rostrum placed in the breast, and formed of a triarticulate sheath, and three unequal bristles. *Wings* four, deflected. *Thorax* gibbous. *Abdomen* terminated by four very short filaments. *Feet* formed for leaping.

General Observations.

The insects of this genus, like the *Aphides*, are found on the leaves, young shoots, and bark of different vegetables. The larvæ have six feet; and are generally covered, more or less, with down. Some have on the hind part of the body a flocculent substance of a white colour. This is particularly seen in the larva of the *C. Alni*; and if rubbed off will be quickly reproduced. The winged or perfect insects leap with great agility. The females occasion the little tubercles or galls, seen upon the leaves of the ash and other trees, by wounding them

with a tube with which she is provided for the purpose of introducing her eggs into the leaf.

SPECIFICATION.

CHERMES BUXI. C. Buxi. *Linn. Syst. Nat.* 1.
p. 738. *Gmel.* 1. *p.* 2212. *Fabr. Syst. Ent.* *p.* 740.
Spec. Ins. 2. *p.* 391. *Mant. Ins.* 2. *p.* 317.
Reaumur, Ins. 3. *t.* 19. *f.* 1—14.

Inhabits the Box-wood. The larva is to be met with on the young shoots early in the spring.

Pl. 40. a. Natural size. b. Magnified.

CHERMES.



C. Buxi.

GENUS XLI. COCCUS.

GENERIC CHARACTER.

Antennæ filiform. *Rostrum* rising from the breast. *Wings* two, erect, none in the females. *Abdomen* bristly behind.

General Observations.

The Cocci are found on the leaves and bark of various vegetables. They are natives of different parts of the world, and many of the species are found in England. There is one exotic species, universally known as producing that beautiful colour called cochineal. This proceeds from the *Coccus Cacti*, so named from its feeding on that succulent plant, the *Cactus Opuntia*. It forms an article of commerce of no mean consideration between this country and South America; where, especially in the country of Mexico, the collecting of the drug gives employment to a considerable number of people. It is the female insect, when distended with eggs, so as rather to resemble a seed than an animal, that produces the colour; and

great care is taken to pick her off the plant before she has deposited her eggs, and by so doing defeated the purpose of the proprietor.

One of the species, the *Coccus Hesperidum*, infests our conservatories of plants, sometimes in such numbers as to injure the shrubs, &c. They run up and down the branches and leaves, and are most abundant upon the orange, citron, and lemon-trees. They are so prolific, that a single female is said to contain about a thousand eggs.

SPECIFICATION.

COCCUS PERSICÆ. *C. persicæ rotundus.* *Linn. Syst.*

Nat. Gmel. 1. p. 2220.

Geoff. Ins. 1. p. 506.

Reaumur, Ins. 4. t. 2. f. 1, 3.

Inhabits the peach.

Pl. 41. a. Natural size. b. c. The same magnified.

COCCVS.



C. Persicorum.

GENUS XLII. *THRIPS*.

GENERIC CHARACTER

Antennæ filiform, as long as the thorax. *Rostrum* indistinct. *Body* slender, linear. *Abdomen* curved upwards. *Wings* four, straight, lying on the back, narrow, and slightly crossed.

General Observations.

The insects of this genus are so diminutive as almost to escape notice. They live in flowers, and under the bark of trees. In the same places we meet with the larvæ, which differ only in the want of wings from the perfect insect. The most common of the tribe, the *T. Physapus*, is a very small, black insect, frequently seen in the spring and summer running upon the petals of different flowers, or skipping from place to place, and bending back its body as it goes.

It is said to be very hurtful to grain.

SPECIFICATION.

THRIPS PHYSAPUS. Th. elytris glaucis, corpore atro.

Linn. Syst. Nat. 1. p. 743. *Gmel.* 1. p. 2222. *Fabr.*

Spec. Ins. 2. p. 396. *Mant. Ins.* 2. p. 320.

Degeer, Ins. 3. p. 6. t. 1. f. 1.

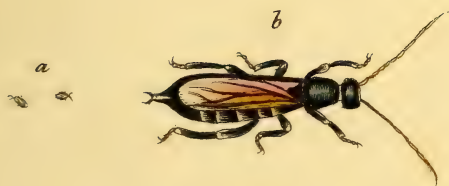
Schaeff. Elem. t. 127.

Inhabits flowers, especially those of the class Syngenesia, descending to the bottom of the florets.

Pl. 42. a. Natural size. b. The same magnified.

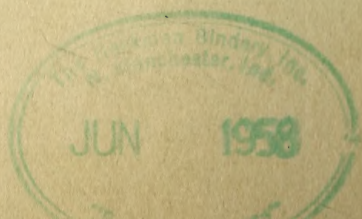
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THRYPS.



T. Physapus.





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